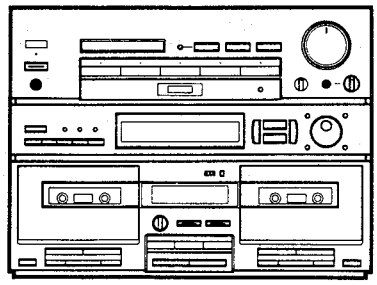
Service Manual

PIONEER®
The Art of Entertainment



ORDER NO.
ARP2137

STEREO DOUBLE CASSETTE DECK AMPLIFIER

DC-Z94

MODEL DC−Z94 HAS FOLLOWING VERSIONS :

Type	Power requirement	Export destination
HE	AC220V, 240V (Switchable) *	European continent
HB	AC220V, 240V (Switchable) *	United Kingdom
HEWZIW	AC220V, 240V (Switchable) *	Germany and Italy
YPW	AC240V only	Australia
SD	AC110V, 120−127V, 220V, 240V (switchable)	Kingdom of SaudiArabia and general market

* Change the jumper wires of assembly board.

- **This manual is applicable to the DC−Z94/HE and HB types.**
- **As to the HB type, refer to page 53.**
- **As to the other types, refer to applicable service manuals.**
- **This product is a component of a system. As to the system composition, refer to the system manual.**
- **For adjustment refer to ADJUSTMENTS FOR XD−Z54T, XD−Z84T, DC−Z94, DC−Z84 and DC−Z74 (ARP2140).**

CONTENTS

1. EXPLODED VIEWS, PACKING AND PARTS LIST 2
2. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM 12
3. P.C.B 's PARTS LIST 47
4. FOR HB TYPE 53
5. PANEL FACILITIES 54
6. SPECIFICATIONS 58

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

© PIONEER ELECTRONIC CORPORATION 1990

YV DEC. 1990 Printed in Japan.

1. EXPLODED VIEWS, PACKING AND PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

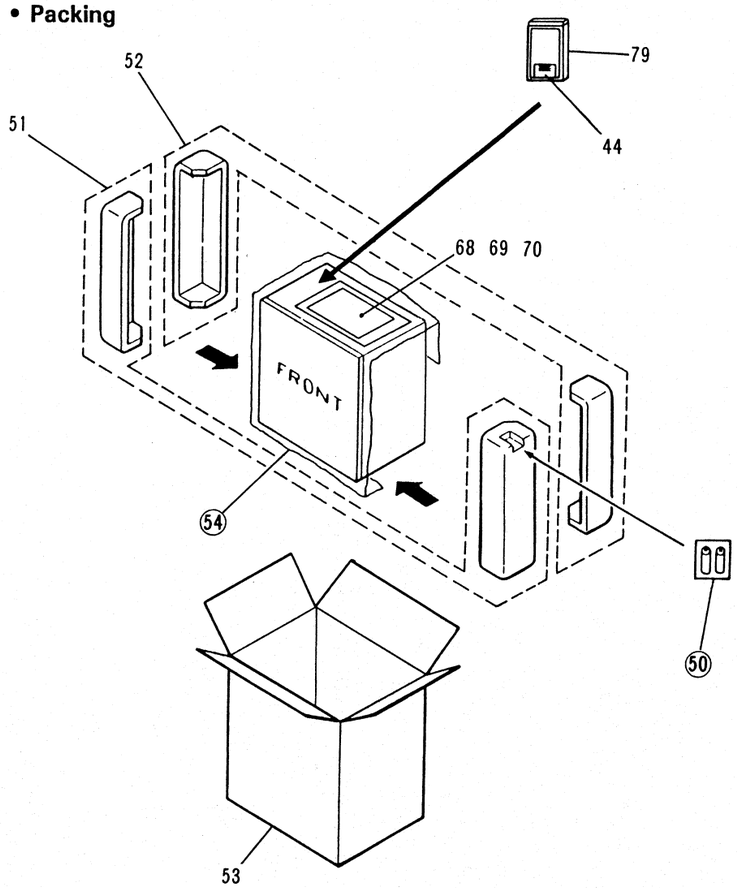
1.1 EXTERIOR AND PACKING

Parts list of Exterior and Packing

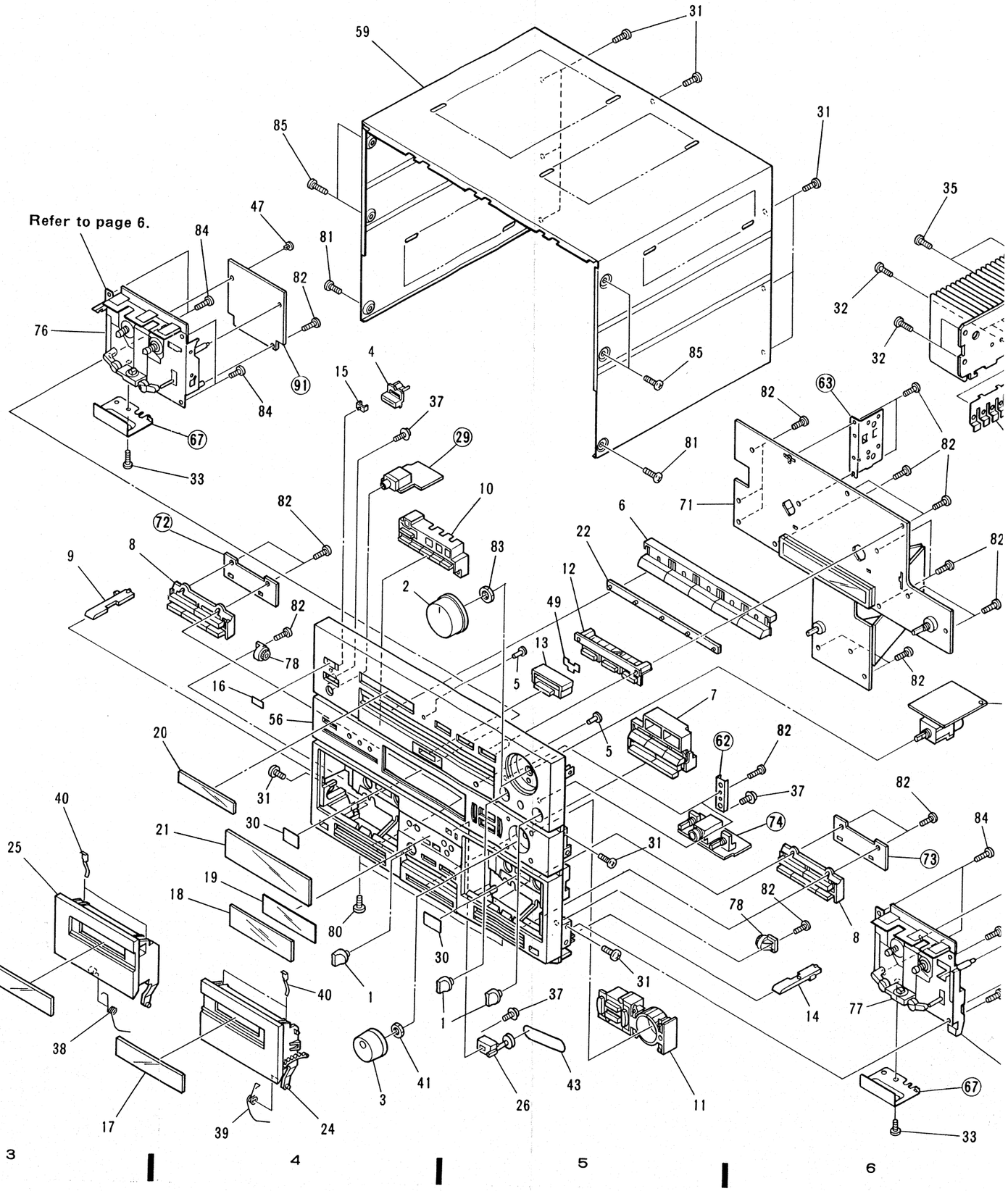
Mark	No.	Description	Parts No.
	1	ROTARY KNOB (Balance, Mic level, Dolby)	AAB1136
	2	VOL KNOB	AAB1200
	3	ROTARY KNOB (Sound jog)	AAB1202
	4	POWER BUTTON	AAD1674
	5	KIN BUTTON (Loudness)	AAD1682
	6	FUNCTION KNOB	AAD1894
	7	REC. COPY BUTTON	AAD1895
	8	DECK PLAY BUTTON	AAD1896
	9	EJECT BUTTON L	AAD1898
	10	GEQ BUTTON	AAD1899
	11	CURSOR BUTTON	AAD1900
	12	AI BUTTON	AAD1901
	13	SURROUND BUTTON	AAD1902
	14	EJECT BUTTON R	AAD1922
	15	LENS (Power IND)	AAK1800
	16	FILTER (REC)	AAK1812
	17	DECORATIVE PLATE (DOOR)	AAK2065
	18	DECORATIVE PLATE A (DECK)	AAK2071
	19	DECORATIVE PLATE B (DECK)	AAK2072
	20	AI DECORATIVE PLATE	AAK2073
	21	DECORATIVE PLATE (GEQ)	AAK2074
	22	INDICATOR LENS	AAK2075
⊙	23	AF ASSEMBLY	AWZ3339
	24	CASSETTE DOOR (R)	AAN1250
	25	CASSETTE DOOR (L)	AAN1251
	26	COUNTER	AAW1009
	27	TRANS CONNECT ASSEMBLY	
	28	VR ASSEMBLY	
	29	HEAD PHONE ASSEMBLY	
	30	FABEL (PAPER)	AAX1301
	31	SCREW	ABA–298
	32	SCREW (STEEL)	ABA1007
	33	SCREW (STEEL)	ABA1009
	34	SCREW (STEEL)	ABA1011
	35	SCREW	ABA1018
	36	SCREW	ABA1082
	37	SCREW (STEEL)	ABA1095
	38	DOOR SPRING L	ABH1068
	39	DOOR SPRING R	ABH1069
	40	KEEP PLATE	ABK1016
	41	NUT	ABN1016
⚠	42	AC POWER CORD	ADG1049
	43	COUNTER BELT	AEB1161
	44	BATTERY COVER	AZN1846
	45	LEG ASSEMBLY	AEC–847
	46	STRAIN RELIEF	AEC–882
	47	NYLON REVET	AEC1160
⊙	48	DELAY & GEQ ASSEMBLY	AWX1050
	49	SEAL	AEE1049
	50	DRY CELL BATTERY (R03, AAA)	
	51	FRONT PAD L, R	AHA1404
	52	REAR PAD L, R	AHA1405
	53	PACKING CASE	AHD1965
	54	SHEET	
	55	TERMINAL SCREW (EARTH)	
	56	FRONT PANEL	AMB1741
	57	CHASSIS	
	58	REAR PANEL	
	59	BONNET	ANE1273
	60	PACK HOLDER	
	61	HEAT SINK HOLDER B	
	62	HOLDER	
	63	HEAT SINK HOLDER A	
	64	PCB HOLDER	
	65	HOLDER	
	66	HEAT SINK	
	67	SHIELD PLATE (MECHA)	
	68	OPERATING INSTRUCTIONS (Nederlands, Svenska, Español, Português)	ARC1244
	69	OPERATING INSTRUCTIONS (English, Deutsch, Françias, Italiano)	ARE1177
	70	CAUTION CARD	ARM1003
⊙	71	DISPLAY ASSEMBLY	AWZ3352
	72	1 MECHA SW ASSEMBLY	
	73	2 MECHA SW ASSEMBLY	
	74	MIC BALANCE ASSEMBLY	
⊙	75	SUB TRANS ASSEMBLY	AWR1060

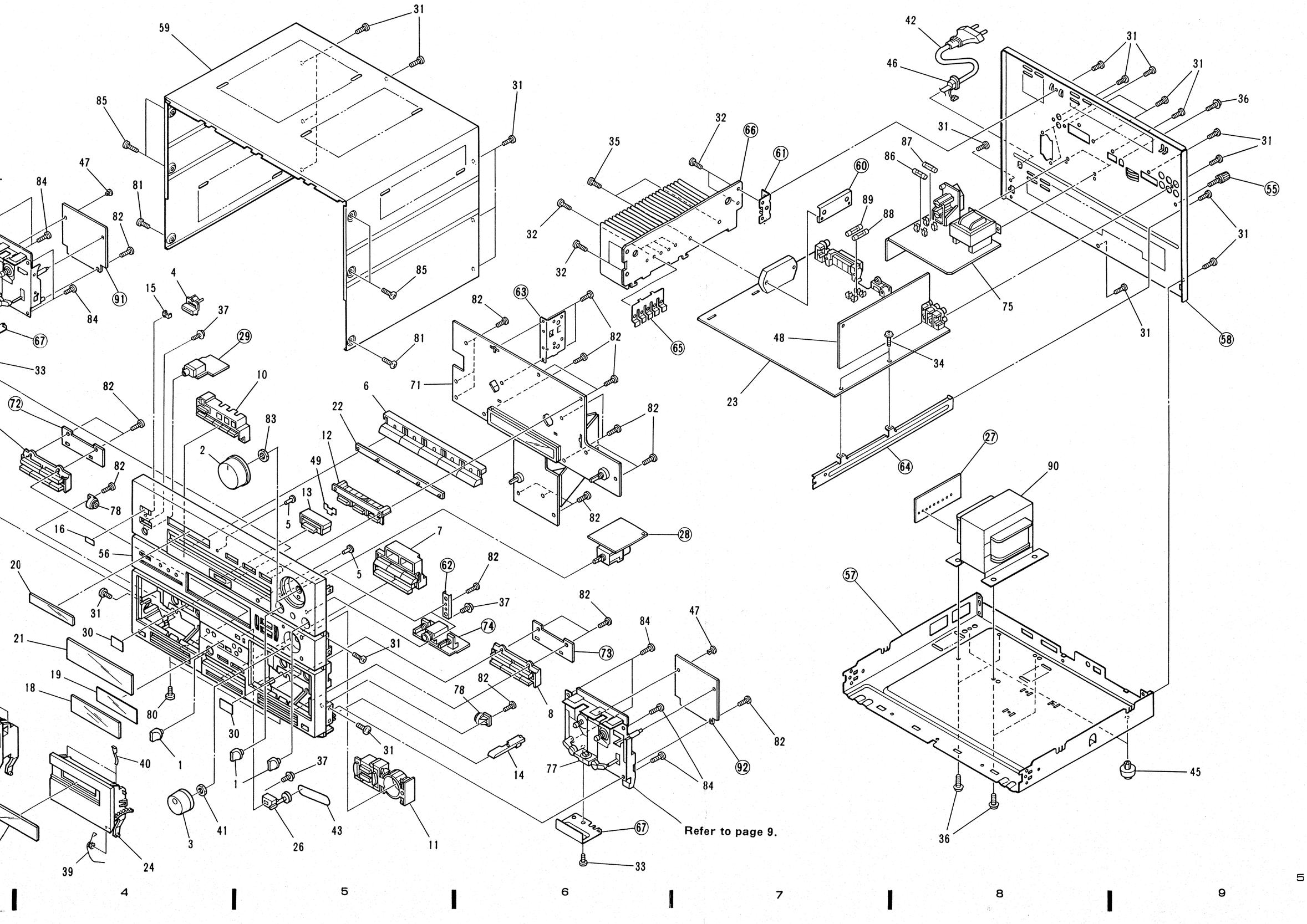
Mark	No.	Description	Parts No.
	76	1 MECHA UNIT	EXK2020
	77	2 MECHA UNIT	EXK2010
	78	DAMPER ASSEMBLY	AXA1008
	79	REMOTE CONTROL UNIT (CU−DC022)	AXD1183
	80	SCREW	BBZ30P060FZK
	81	SCREW	BBZ30P080FZK
	82	SCREW	BPZ26P080FMC
	83	NUT	NK90FUC
	84	SCREW	VPZ30P080FMC
	85	SCREW	VPZ30P080FZK
⚠	86	FUSE (T2.5A, FU101)	AEK−403
⚠	87	FUSE (T2A, FU102)	AEK−017
⚠	88	FUSE (T800mA, FU151)	AEK−031
⚠	89	FUSE (T800mA, FU152)	AEK−031
⚠	90	POWER TRANSFORMER (T2001)	ATS1322
	91	1 MECHA ASSEMBLY	
	92	2 MECHA ASSEMBLY	

• Packing



• Exterior





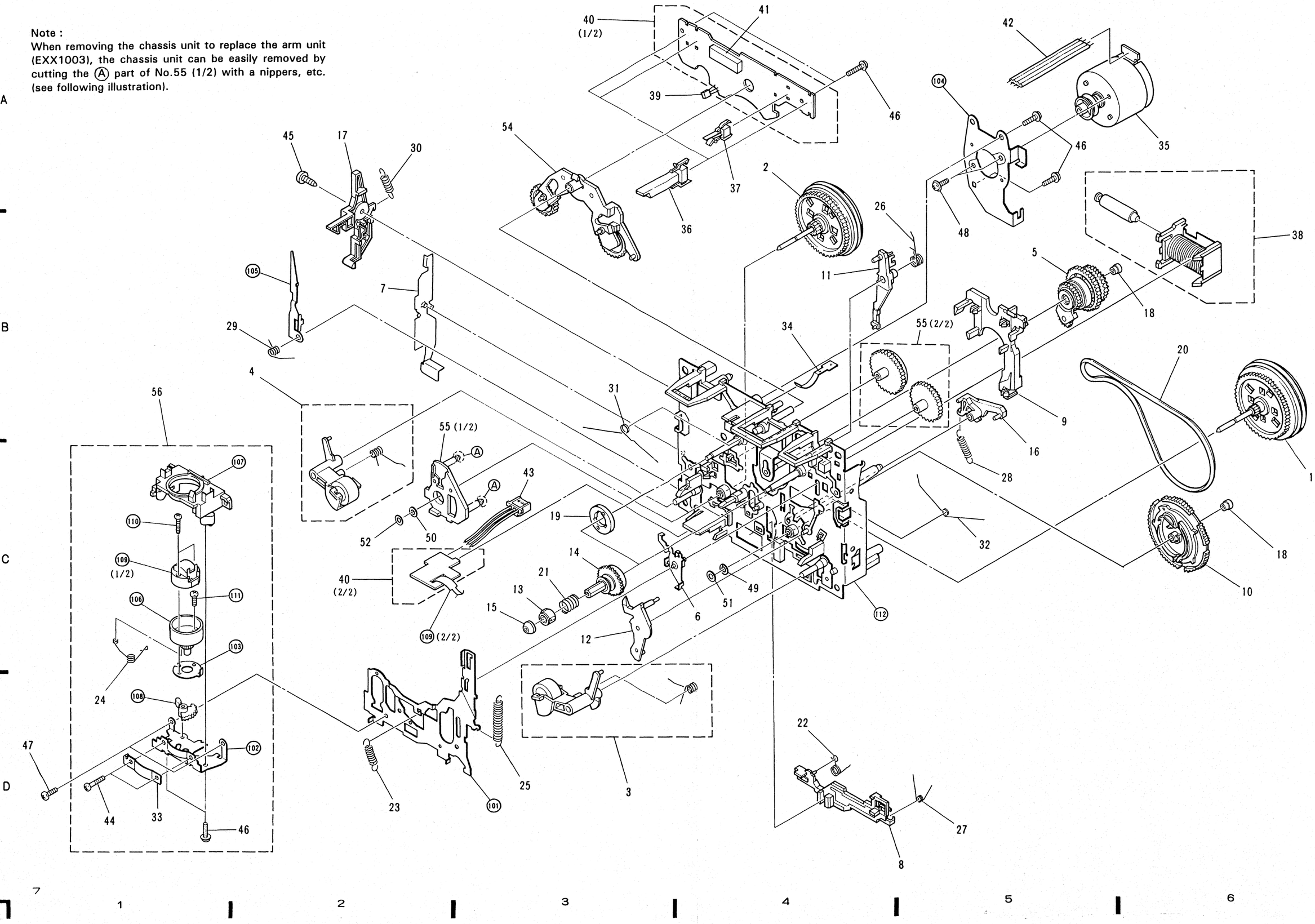
Refer to page 9.

1.2 1 MECHA UNIT (EXK2020)

Parts list of 1 Mecha unit

Mark	No.	Description	Parts No.
	1	FLYWHEEL UNIT (FWD)	EXA1102
	2	FLYWHEEL UNIT (RVS)	EXA1103
	3	ROLLER UNIT (FWD)	EXA1104
	4	ROLLER UNIT (RVS)	EXA1105
	5	LIMITER UNIT	EXA1106
	6	LEVER UNIT	EXA1107
	7	ARM	AZN2063
	8	NR LEVER	ENV1155
	9	BRAKE	ENV1157
	10	CAM GEAR	ENV1158
	11	LOCK ARM	ENV1159
	12	NR ARM	ENV1163
	13	REEL COLLAR	ENV1164
	14	REEL	ENV1170
	15	REEL BUSH	ENV1178
	16	ARM	ENV1181
	17	ARM	AZN2069
	18	BUSH	ENV1184
	19	MAGNET	ENV1185
	20	BELT	ENT1015
	21	SPRING	EBH1201
	22	SPRING	EBH1202
	23	SPRING	EBH1203
	24	SPRING	EBH1204
	25	SPRING	EBH1208
	26	SPRING	EBH1209
	27	SPRING	EBH1210
	28	SPRING	EBH1211
	29	SPRING	EBH1255
	30	SPRING	EBH1213
	31	SPRING	EBH1220
	32	SPRING	EBH1256
	33	SPRING	EBL1013
	34	SPRING	EBL1014
	35	MOTOR UNIT	EXA1108
	36	SWITCH (Detect)	ESN1003
	37	SWITCH (Mode)	ESN1004
	38	SOLENOID	EXP1005
	39	HALL IC	DN6847SE
	40	P.C.BOARD	ENX1002
	41	CONNECTOR	EKS1013
	42	LEAD WIRE	EDD1003
	43	CONNECTOR	EDE1009
	44	SCREW	EBA1020
	45	SCREW	EBA1021
	46	SCREW (M2 × 8)	ATZ20P080FMC
	47	SCREW	BSZ20P050FMC
	48	SCREW	PMS26P025FCU
	49	WASHER	EBF1008
	50	WASHER	EBF1009
	51	WASHER	EBF1010
	52	WASHER	EBF1011
	53	.....	.....
	54	ARM UNIT	EXX1002
	55	ARM UNIT	EXX1003
	56	P HEAD ASSEMBLY	EXX1005
	101	HEAD BASE	
	102	BRACKET	
	103	PLATE	
	104	BRACKET	
	105	ARM	
	106	HOLDER	
	107	HOLDER	
	108	GEAR	
	109	P HEAD UNIT	
	110	SCREW	
	111	SCREW	
	112	CHASSIS UNIT	

Note :
When removing the chassis unit to replace the arm unit (EXX1003), the chassis unit can be easily removed by cutting the Ⓐ part of No.55 (1/2) with a nippers, etc. (see following illustration).

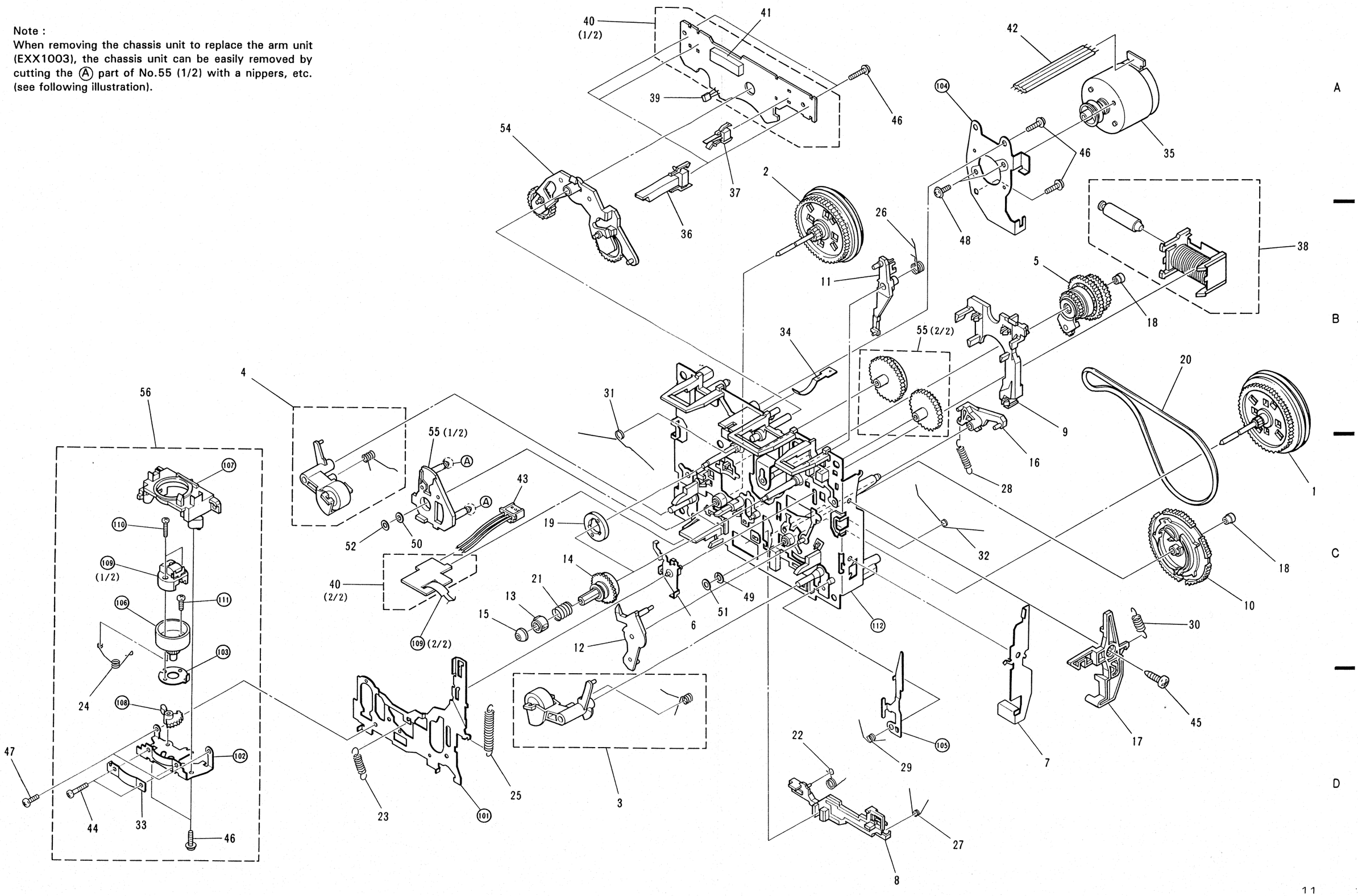


1.3 2 MECHA UNIT (EXK2010)

Parts list of 2 Mecha unit

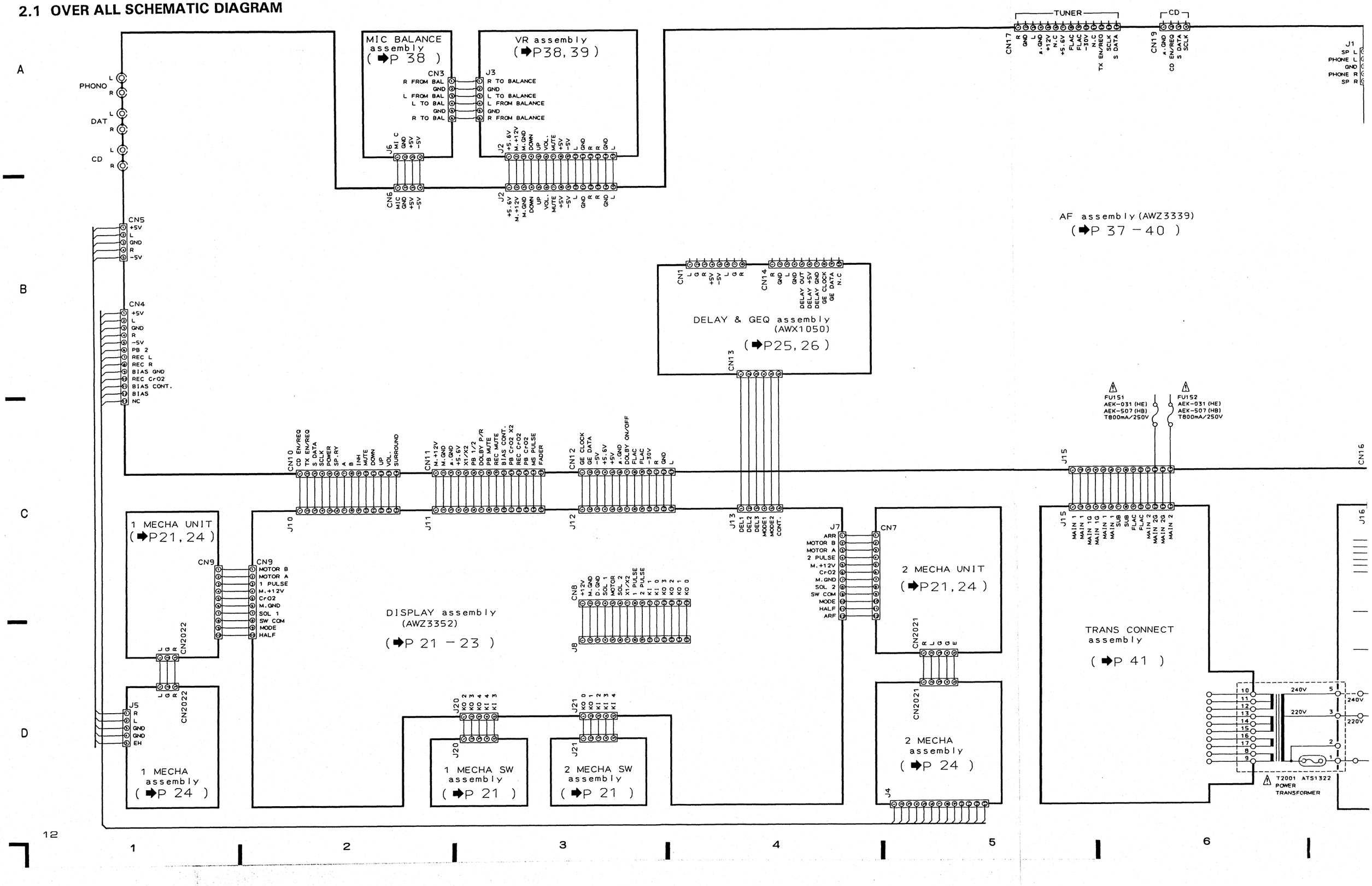
Mark	No.	Description	Parts No.
	1	FLYWHEEL UNIT (FWD)	EXA1102
	2	FLYWHEEL UNIT (RVS)	EXA1103
	3	ROLLER UNIT (FWD)	EXA1104
	4	ROLLER UNIT (RVS)	EXA1105
	5	LIMITER UNIT	EXA1106
	6	LEVER UNIT	EXA1107
	7	ARM	AZN2064
	8	NR LEVER	ENV1155
	9	BRAKE	ENV1157
	10	CAM GEAR	ENV1158
	11	LOCK ARM	ENV1159
	12	NR ARM	ENV1163
	13	REEL COLLAR	ENV1164
	14	REEL	ENV1170
	15	REEL BUSH	ENV1178
	16	ARM	ENV1181
	17	ARM	AZN2070
	18	BUSH	ENV1184
	19	MAGNET	ENV1185
	20	BELT	ENT1015
	21	SPRING	EBH1201
	22	SPRING	EBH1202
	23	SPRING	EBH1203
	24	SPRING	EBH1204
	25	SPRING	EBH1208
	26	SPRING	EBH1209
	27	SPRING	EBH1210
	28	SPRING	EBH1211
	29	SPRING	EBH1254
	30	SPRING	EBH1213
	31	SPRING	EBH1220
	32	SPRING	EBH1256
	33	SPRING	EBL1013
	34	SPRING	EBL1014
	35	MOTOR UNIT	EXA1108
	36	SWITCH (Detect)	ESN1003
	37	SWITCH (Mode)	ESN1004
	38	SOLENOID	EXP1005
	39	HALL IC	DN6847SE
	40	P.C.BOARD	ENX1002
	41	CONNECTOR	EKS1012
	42	LEAD WIRE	EDD1003
	43	CONNECTOR	EDE1008
	44	SCREW	EBA1020
	45	SCREW	EBA1021
	46	SCREW (M2×8)	ATZ20P080FMC
	47	SCREW	BSZ20P050FMC
	48	SCREW	PMS26P025FCU
	49	WASHER	EBF1008
	50	WASHER	EBF1009
	51	WASHER	EBF1010
	52	WASHER	EBF1011
	53	.....	.....
	54	ARM UNIT	EXX1002
	55	ARM UNIT	EXX1003
	56	R/P HEAD ASSEMBLY	EXX1004
	101	HEAD BASE	
	102	BRACKET	
	103	PLATE	
	104	BRACKET	
	105	ARM	
	106	HOLDER	
	107	HOLDER	
	108	GEAR	
	109	R/P HEAD UNIT	
	110	SCREW	
	111	SCREW	
	112	CHASSIS UNIT	

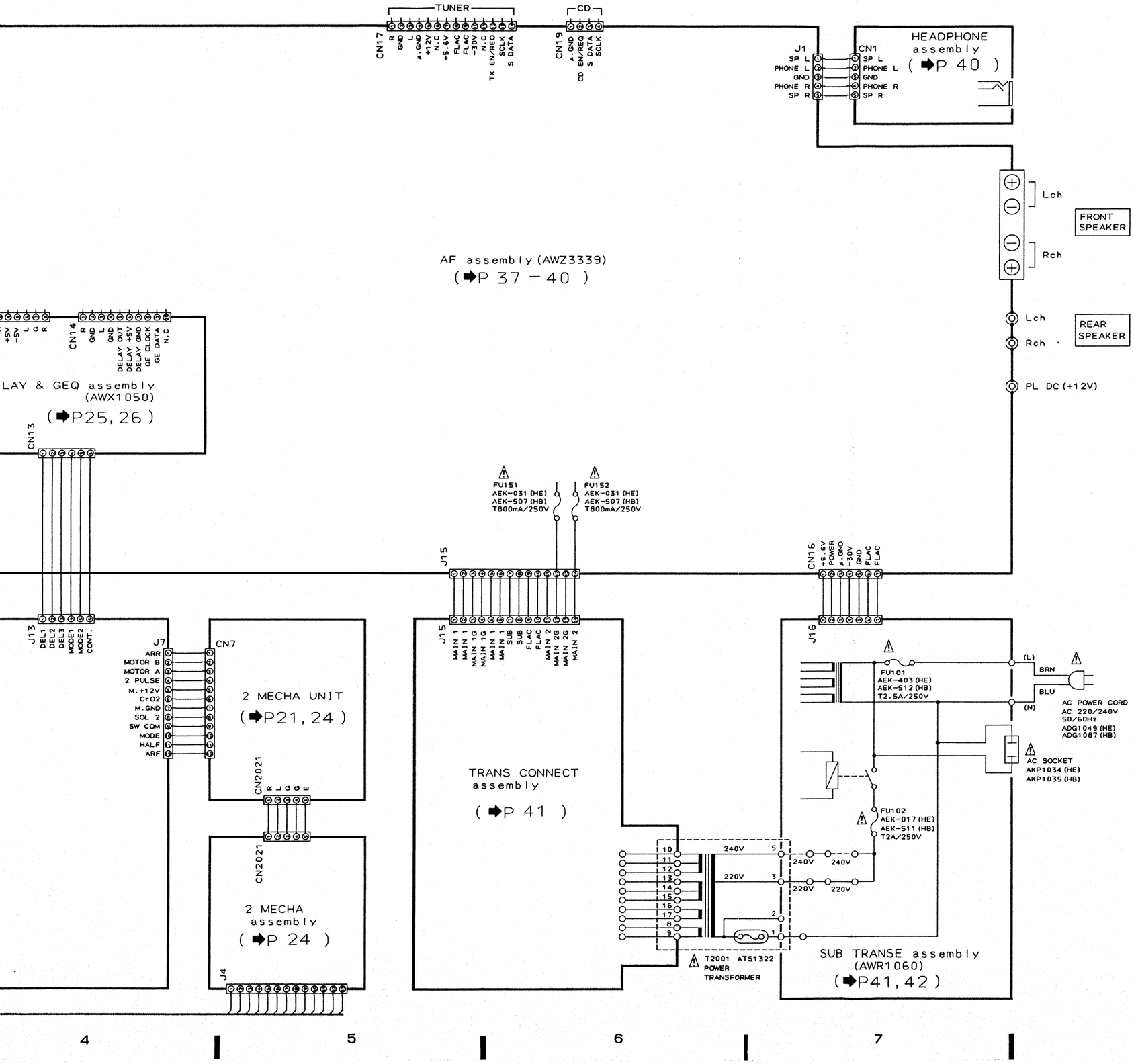
Note :
When removing the chassis unit to replace the arm unit (EXX1003), the chassis unit can be easily removed by cutting the Ⓐ part of No.55 (1/2) with a nippers, etc. (see following illustration).



2. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM

2.1 OVER ALL SCHEMATIC DIAGRAM





1. RESISTORS:
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

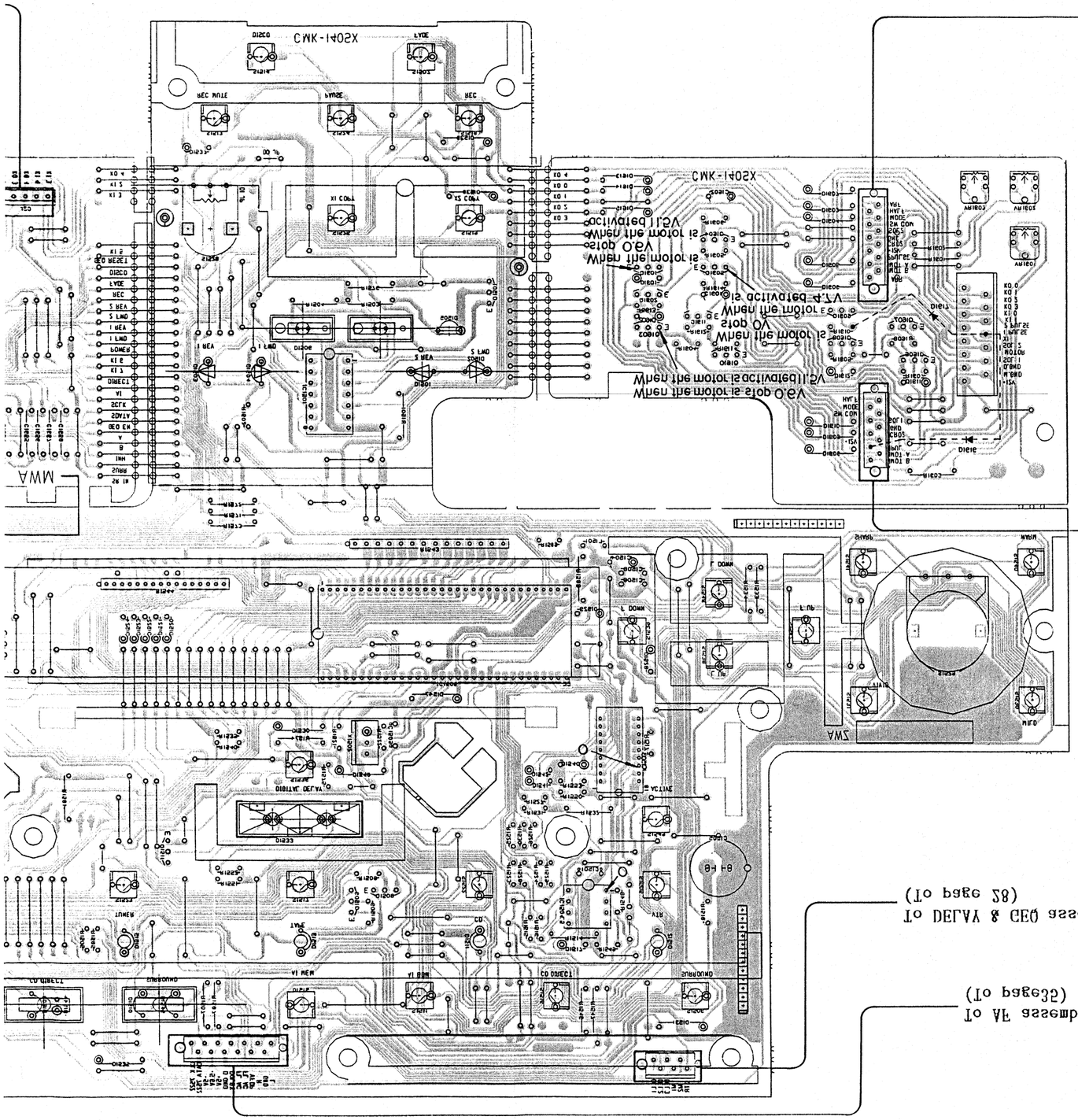
3. VOLTAGE, CURRENT:
▭ : Signal voltage at (55W + 55W 8Ω)output (1kHz)
▱ : DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
⇦ mA : DC current at no input signal

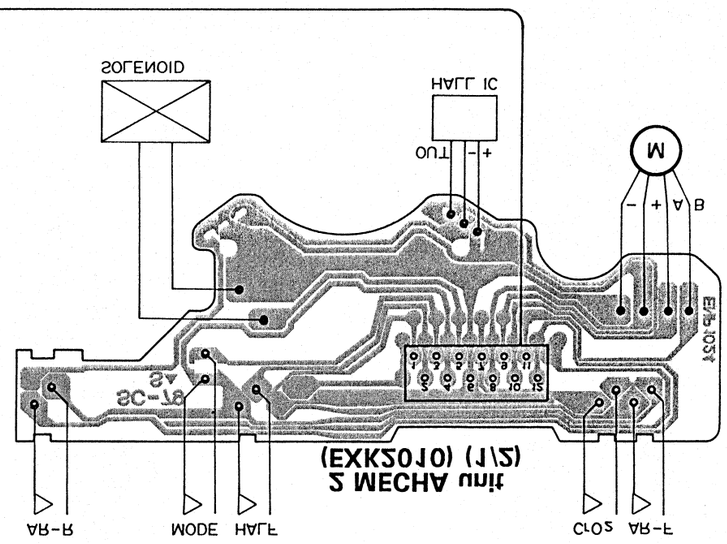
4. OTHERS:
➡ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

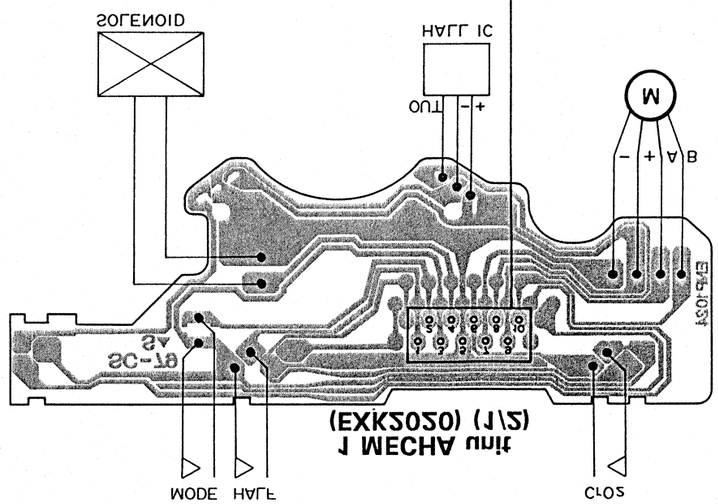
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

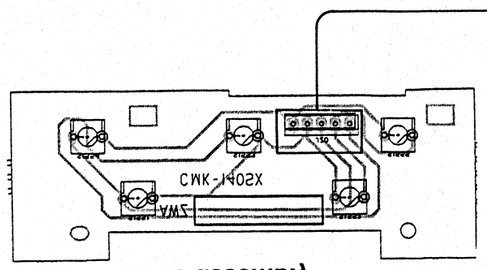
SWITCHES:

DISPLAY assembly		1 MECHA SW assembly	
S1504	POWER	S1551	1 REV
S1505	VIDEO	S1552	1 PLAY
S1506	CD DIRECT	S1553	1 STOP
S1507	FADE/FINE	S1554	1 REW
S1510	AI MEMO	S1555	1 FF
S1511	AI BGM		
S1512	PHONO		
S1513	2 REC MUTE	2 MECHA SW assembly	
S1514	DISCO	S1556	2 STOP
S1516	SURR	S1557	2 REV
S1517	TAPE	S1558	2 PLAY
S1518	2 REC	S1559	2 REW
S1519	X2 COPY	S1560	2 FF
S1522	CD		
S1523	TX		
S1524	2 PAUSE		
S1525	X1 COPY		
S1528	DOLBY NR ON/OFF		
S1529	COM-A-B		
S1530	MILD		
S1531	VIVID		
S1532	FLAY		
S1533	/D		
S1534	/B		
S1535	MEMOLY		
S1536	DIGITAL SURR		
S1537	EQ ON/OFF		
S1538	LEVEL UP		
S1539	F DOWN		
S1540	WARM		
S1541	SHARP		
S1542	/E		
S1543	/C		
S1544	/A		
S1546	PGM/PRESET		
S1547	F UP		
S1548	LEVEL DOWN		
S1549	ACTIVE LOUNDNESS		

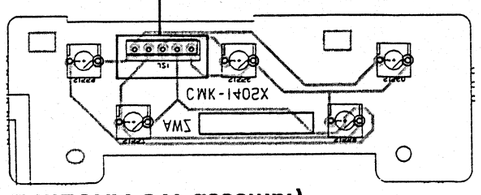

CNK-1402X
MWA
When the motor is stop 0.0
When the motor is activating 0.2
When the motor is 0.2
When the motor is activating 1.2
When the motor is stop 0.0
When the motor is 1.2
When the motor is activating 1.2
When the motor is stop 0.0
VR1601–VR1602
IC1201
IC1202
IC1203
IC1204
D1201
D1601–D1602
D1611
D1610
D1606–D1609
D1608 D1609
D1611
To DELAY & CEO assembly CN13
(To page 28)
To AF assembly CN15
(To page32)


SOLENOID
HALL IC
OUT
M
B A + –
E4-1034
S MECHA unit
(EXK5050) (J\S)
AR-R
MODE
HALT
CLOS
AR-F

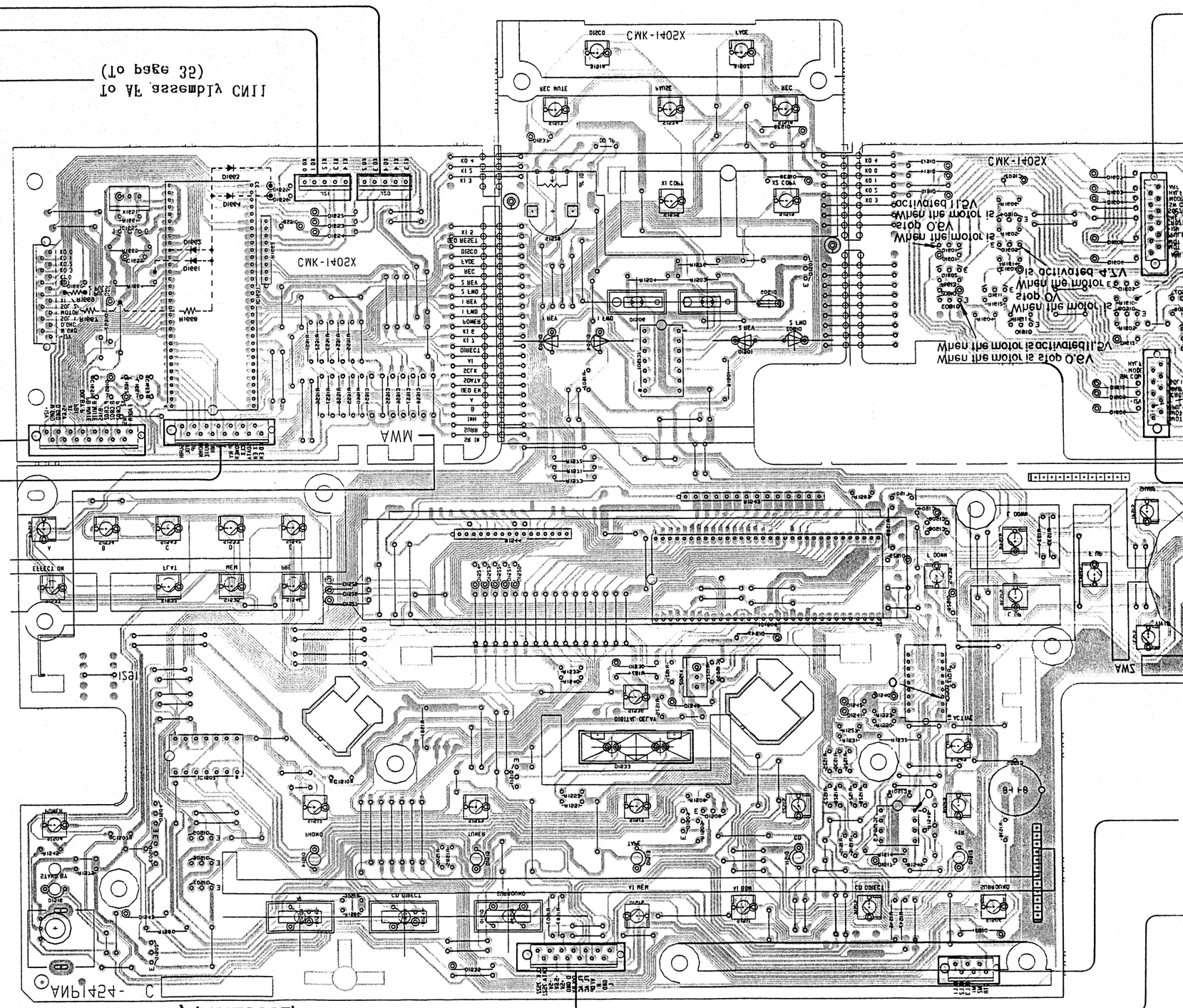

SOLENOID
HALL IC
OUT
M
B A + –
E4-1034
J MECHA unit
(EXK5050) (J\S)
MODE
HALT
CLOS



7 MECHA WS assembly



5 MECHA WS assembly



DISPLAY assembly (AWZ3325)

This P.C.B. connection diagram is viewed from the foil side.

IC1625 IC1621

IC1502 TO610–SO610

IC1201 IC1202 IC1203 IC1204

IC1111 IC1610 IC1608 IC1609 IC1610 IC1611 IC1612 IC1613–IC1630

2.2 DISPLAY (AWZ3352), 1 MECHA SW, 2 MECHA SW assembly, 1 MECHA UNIT (EXK2020) and 2 MECHA UNIT (EXK2010)

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 E	E or E	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513	+	Capacitor (Polarity)
C518		Capacitor (Non-polarity)

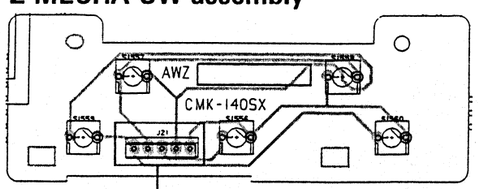
Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

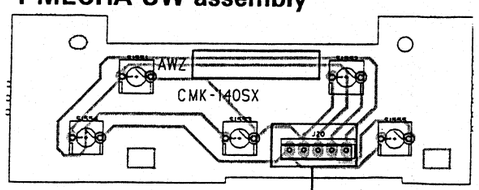
3. The capactor terminal marked with ◎(double circles) shows negatine termianl.
4. The diode terminal marked with ◎(double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

To AF assembly CN10
(To page 35)

2 MECHA SW assembly



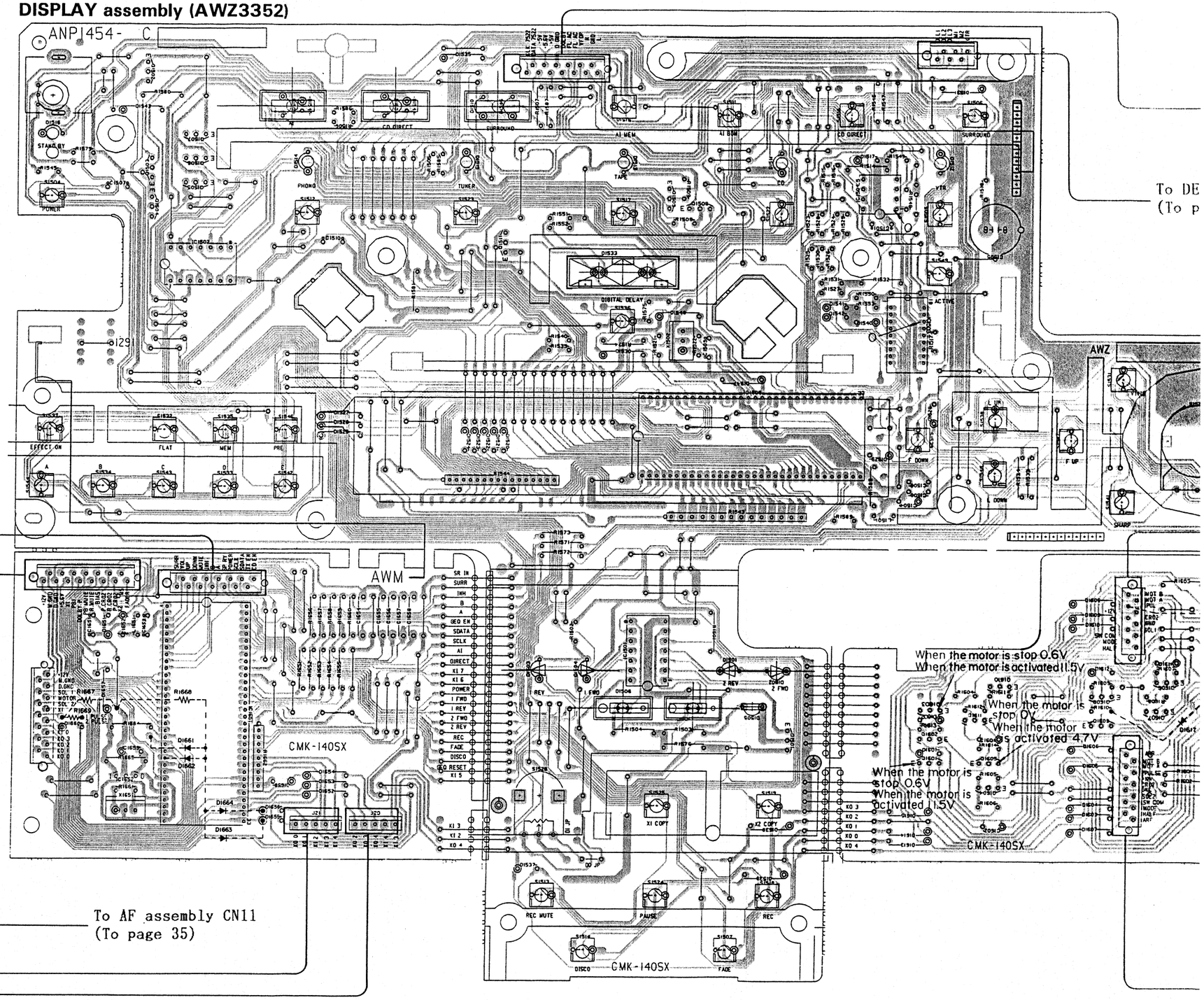
1 MECHA SW assembly



To AF assembly CN11
(To page 35)

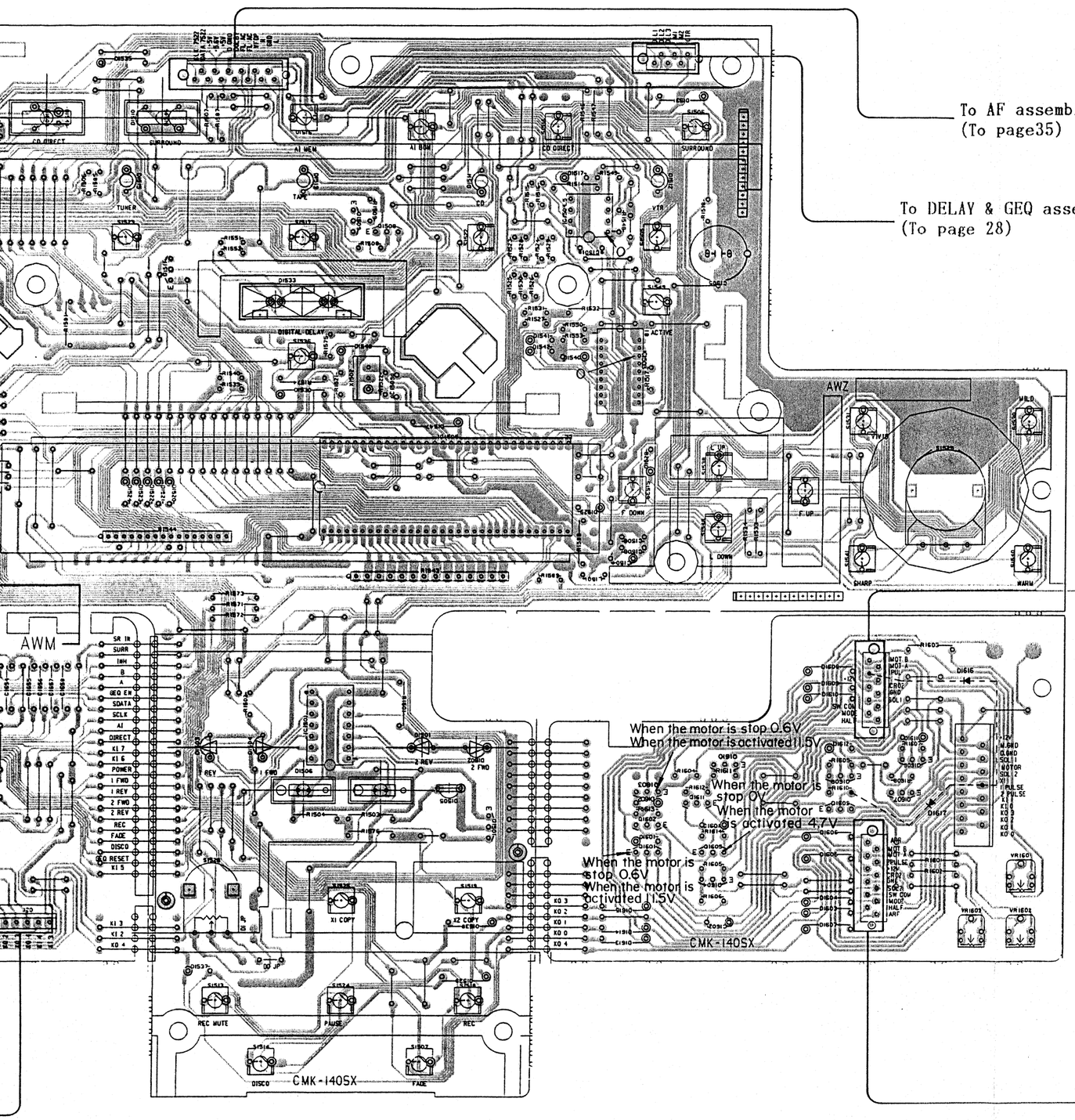
Q1502–Q1507 IC1502 Q1511 Q1509 Q1508 IC1504
IC1505 IC1503
IC1652 IC1651 IC1501 Q1501 Q1601–Q1605 Q1611 Q1610 Q1606–Q1609

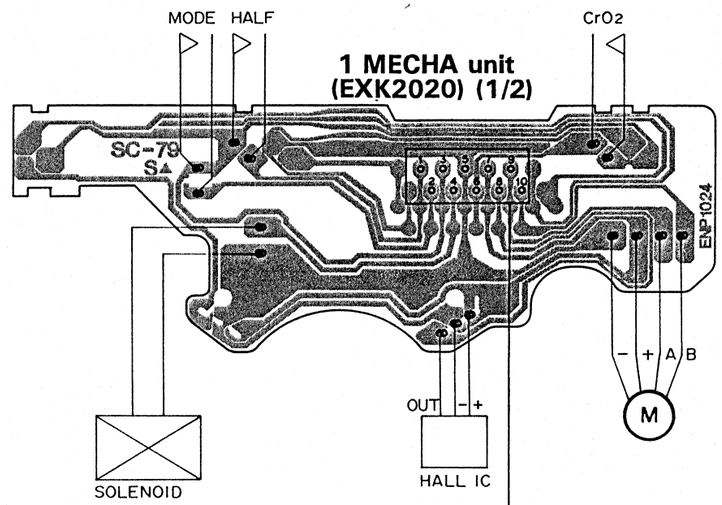
DISPLAY assembly (AWZ3352)

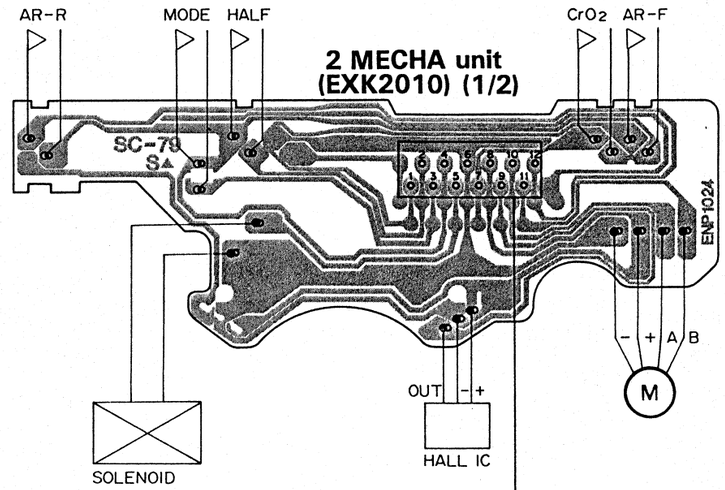


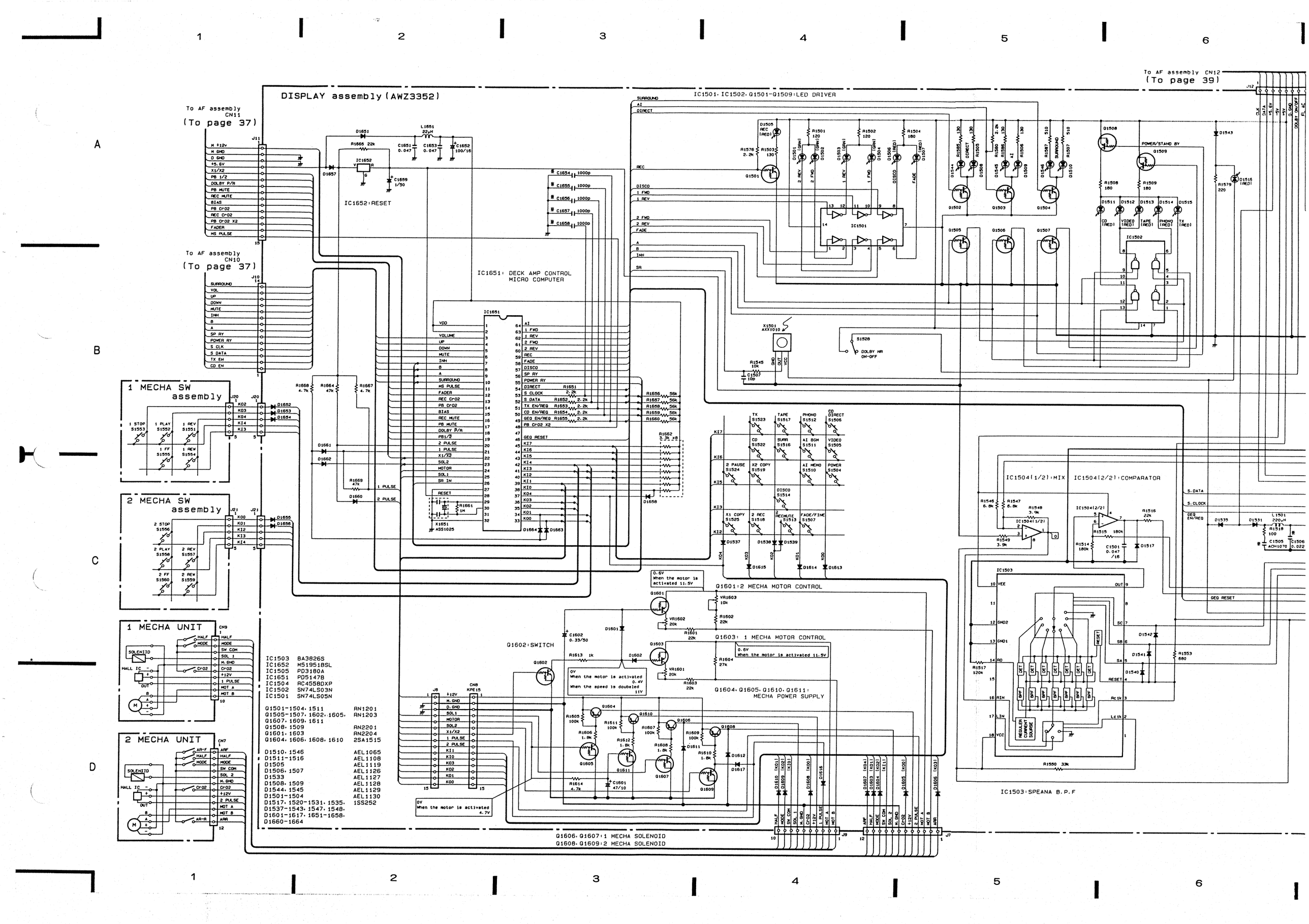
Q1511 Q1509 Q1508 IC1504 IC1505 IC1503 IC1501 Q1501 Q1601–Q1605 Q1611 Q1610 Q1606–Q1609

VR1601–VR1603









DISPLAY assembly (AWZ3352)
To AF assembly CN11 (To page 37)
To AF assembly CN10 (To page 37)
To AF assembly CN12 (To page 39)
IC1652:RESET
IC1651: DECK AMP CONTROL MICRO COMPUTER
IC1501, IC1502, Q1501-Q1509:LED DRIVER
1 MECHA SW assembly
2 MECHA SW assembly
1 MECHA UNIT
2 MECHA UNIT
IC1504(1/2):MIX
IC1504(2/2):COMPARATOR
IC1503:SPEANA B.P.F
Q1601:2 MECHA MOTOR CONTROL
Q1603: 1 MECHA MOTOR CONTROL
Q1602:SWITCH
Q1604, Q1605, Q1610, Q1611: MECHA POWER SUPPLY
Q1606, Q1607:1 MECHA SOLENOID
Q1608, Q1609:2 MECHA SOLENOID
IC1503 BA3826S
IC1652 M51951BSL
IC1505 PD3180A
IC1651 PD5147B
IC1504 RC4558DXP
IC1502 SN74LS03N
IC1501 SN74LS05N
Q1501-1504, 1511 RN1201
Q1505-1507, 1602, 1605, RN1203
Q1607, 1609, 1611
Q1508, 1509 RN2201
Q1601, 1603 RN2204
Q1604, 1606, 1608, 1610 2SA1515
D1510, 1546 AEL1065
D1511-1516 AEL1108
D1505 AEL1119
D1506, 1507 AEL1126
D1533 AEL1127
D1508, 1509 AEL1128
D1544, 1545 AEL1129
D1501-1504 AEL1130
D1517, 1520-1531, 1535, 1SS252
D1537-1543, 1547, 1548,
D1601-1617, 1651-1658,
D1660-1664

To AF assembly CN12 (To page 39)

To DELAY & GEQ assembly CN13 (To page 26)

IC1501·IC1502·Q1501–Q1509:LED DRIVER

IC1505:SPEANA CONTROL MICRO COMPUTER

IC1504(1/2):MIX IC1504(2/2):COMPARATOR

IC1503:SPEANA B.P.F

Q1511:LED DRIVE

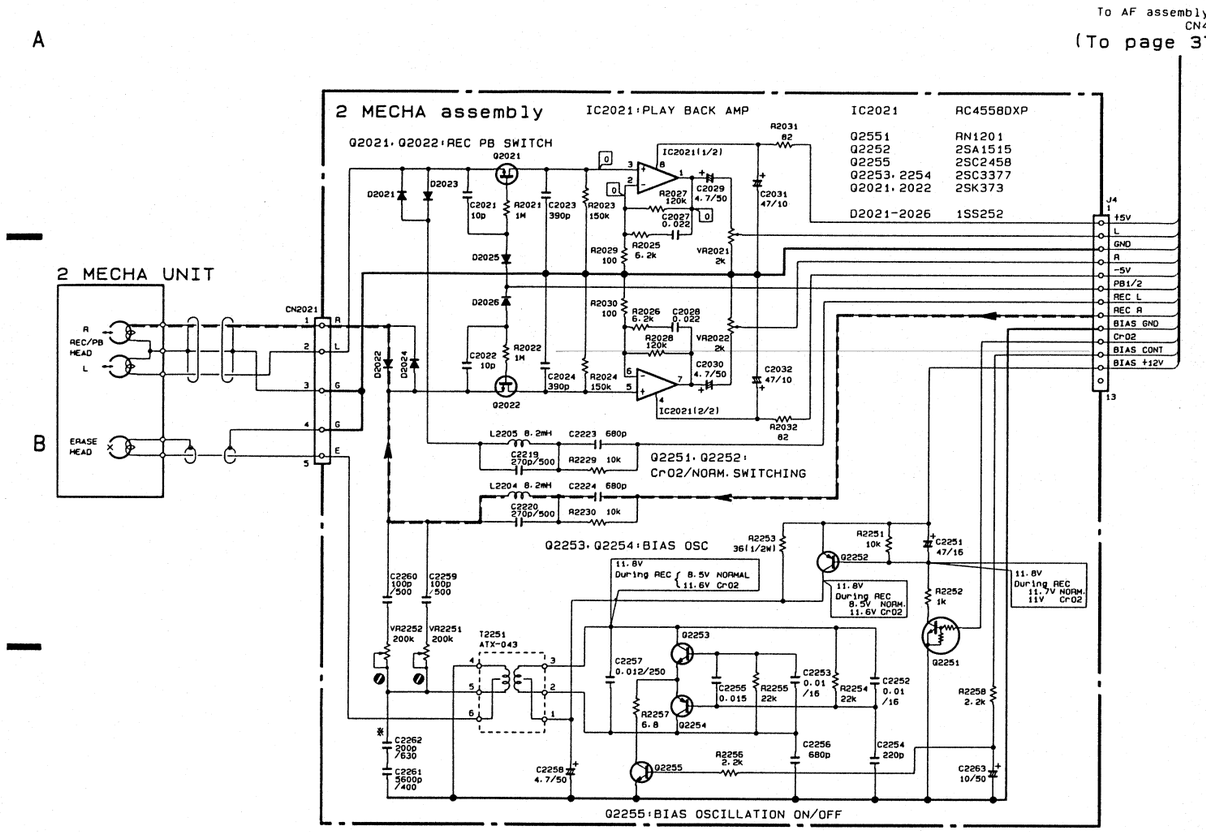
Q1601·2 MECHA MOTOR CONTROL

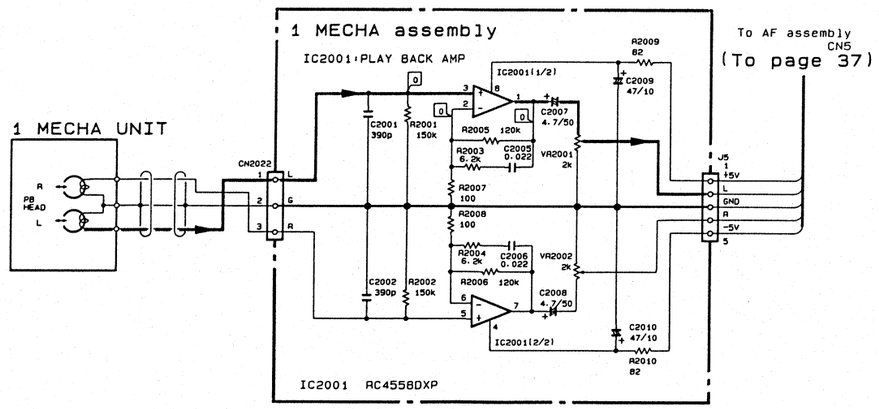
Q1603: 1 MECHA MOTOR CONTROL

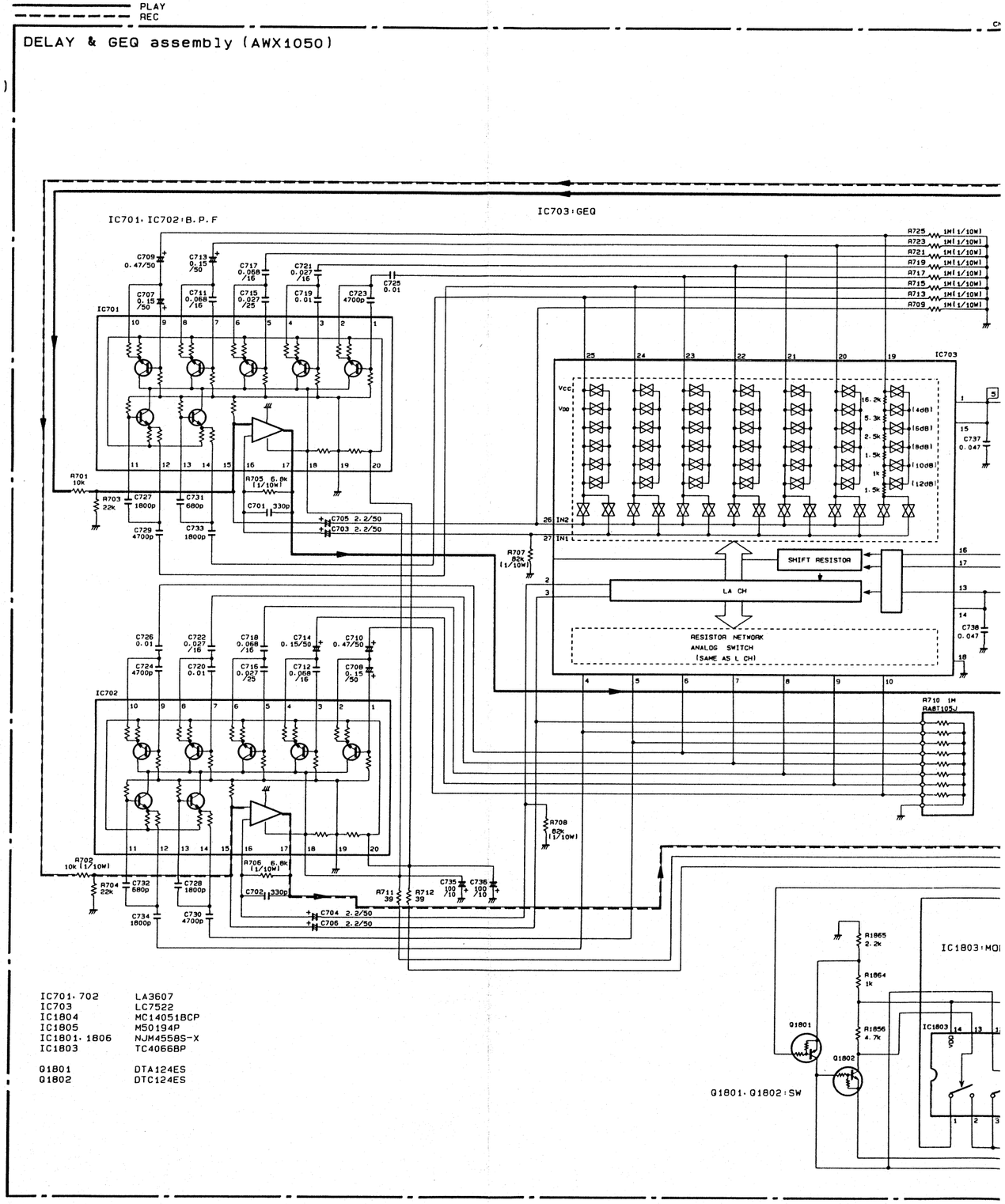
0.6V when the motor is activated 11.5V

Q1604·Q1605·Q1610·Q1611: MECHA POWER SUPPLY

2.3 DELAY & GEQ (AWX1050), 1 MECHA and 2 MECHA assembly







PLAY
REC

& GEQ assembly (AWX1050)

To AF assembly CN1 (To page 37)

To AF assembly CN14 (To page 37)

To DISPLAY assembly J13 (To page 23)

CN1: L IN, GND, R IN, +5V, -5V, L OUT, GND, R OUT

CN14: R IN, L IN, GND, DELAY OUT, +5V(DIG), GND(DIG), CLOCK, DATA

CN13 KPE6: DEL1, DEL2, DEL3, MODE1, MODE2, DELAY MUTE

IC701·IC702:B.P.F

IC703:GEQ

IC1804:SWITCH

IC1806(1/2):BUFFER

IC1801(1/2):L-R

IC1801(2/2):L+R

IC1806(2/2):
LOW FREQUENCY
AMPLIFICATION

IC1803:MODE SELECT

IC1805:DIGITAL DELAY

Q1801·Q1802:SW

SHIFT RESISTOR

LA CH

RESISTOR NETWORK
ANALOG SWITCH
(SAME AS L CH)

·702	LA3607
4	LC7522
5	MC14051BCP
1·1806	M50194P
3	NJM4558S-X
	TC4066BP
	DTA124ES
	DTC124ES

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

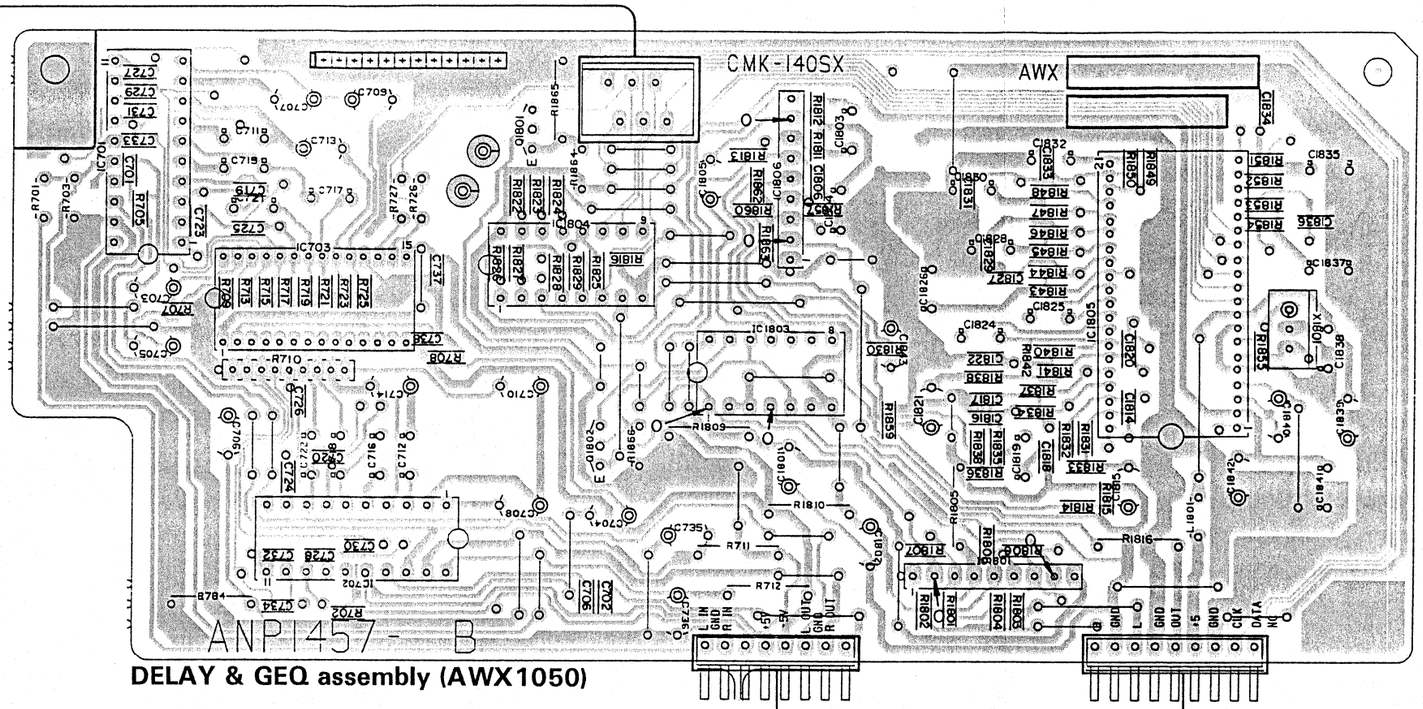
P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 E	E or E	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513		Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

3. The capactor terminal marked with ⓞ(double circles) shows negatine termianl.
4. The diode terminal marked with ⓞ(double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

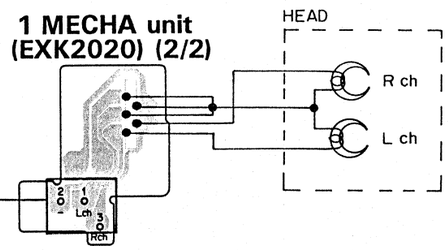
To DISPLAY assembly J13
(To page 19)



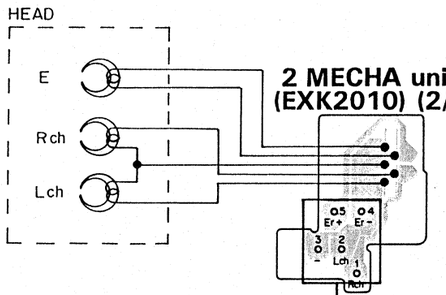
DELAY & GEQ assembly (AWX1050)

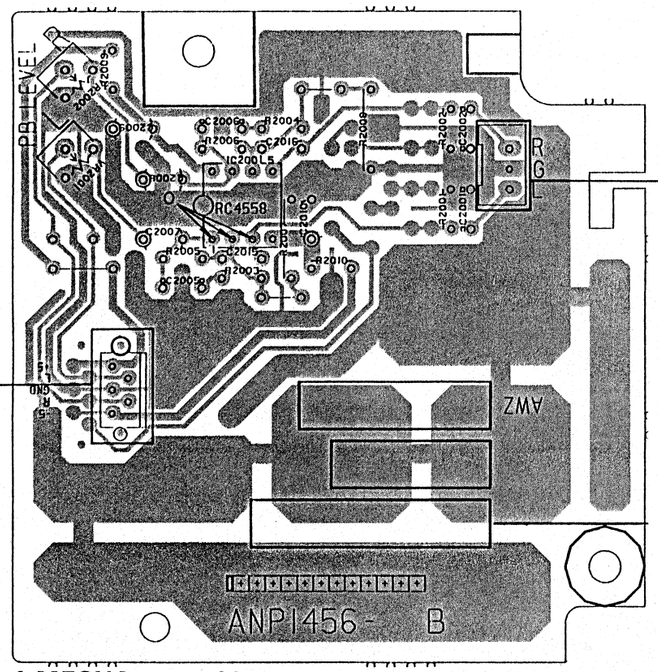
To AF assembly
(To page 35)
To AF assembly
(To page 35)
To AF assembly CN4
(To page 35)
To AF assembly CN5
(To page 35)

1 MECHA unit (EXK2020) (2/2)

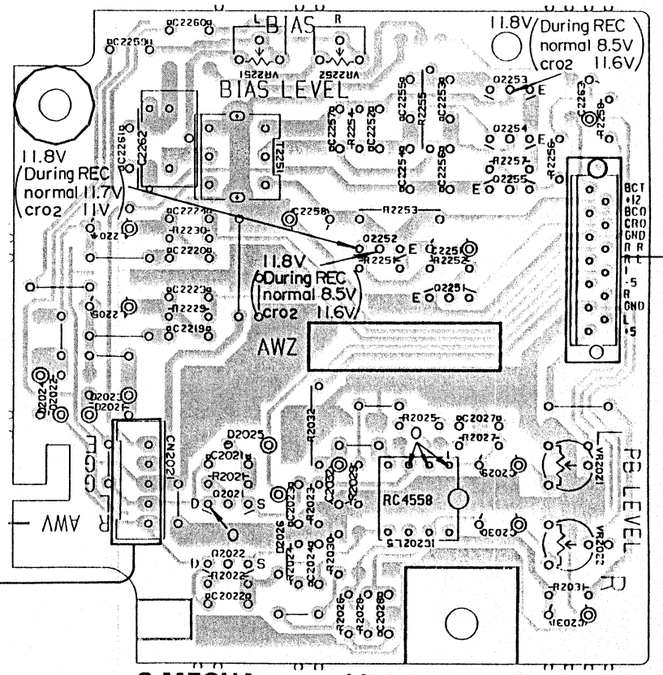


2 MECHA unit (EXK2010) (2/2)



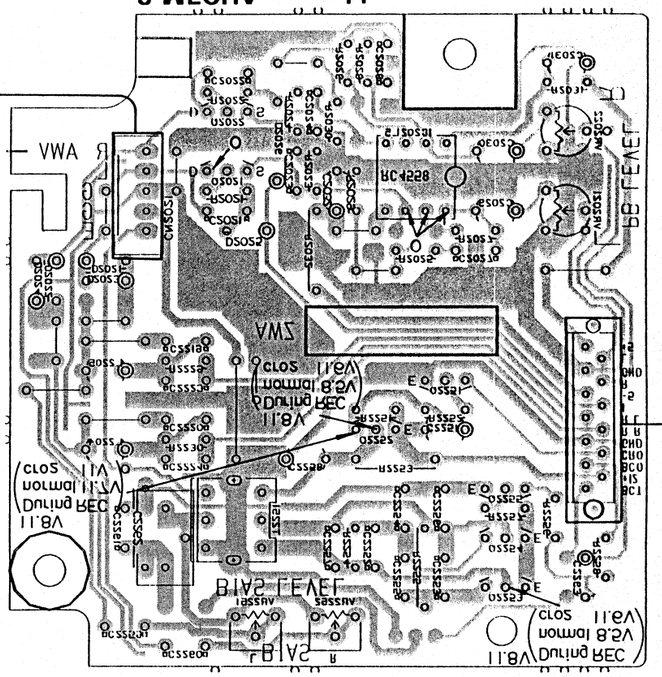


1 MECHA assembly

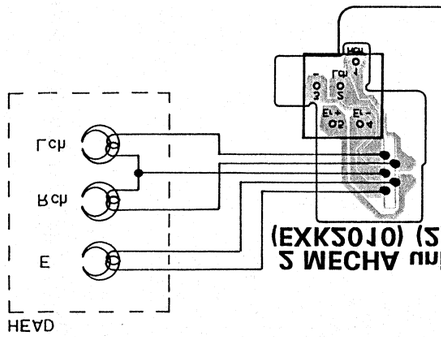


2 MECHA assembly

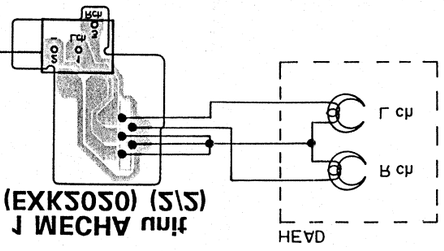
S MECHA assembly



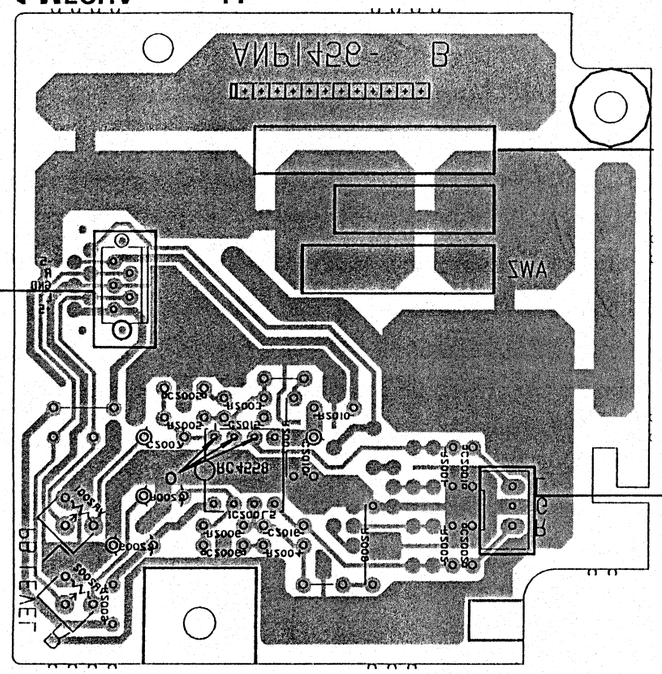
S MECHA unit (EXK5010) (S\S)



J MECHA unit (EXK5050) (S\S)



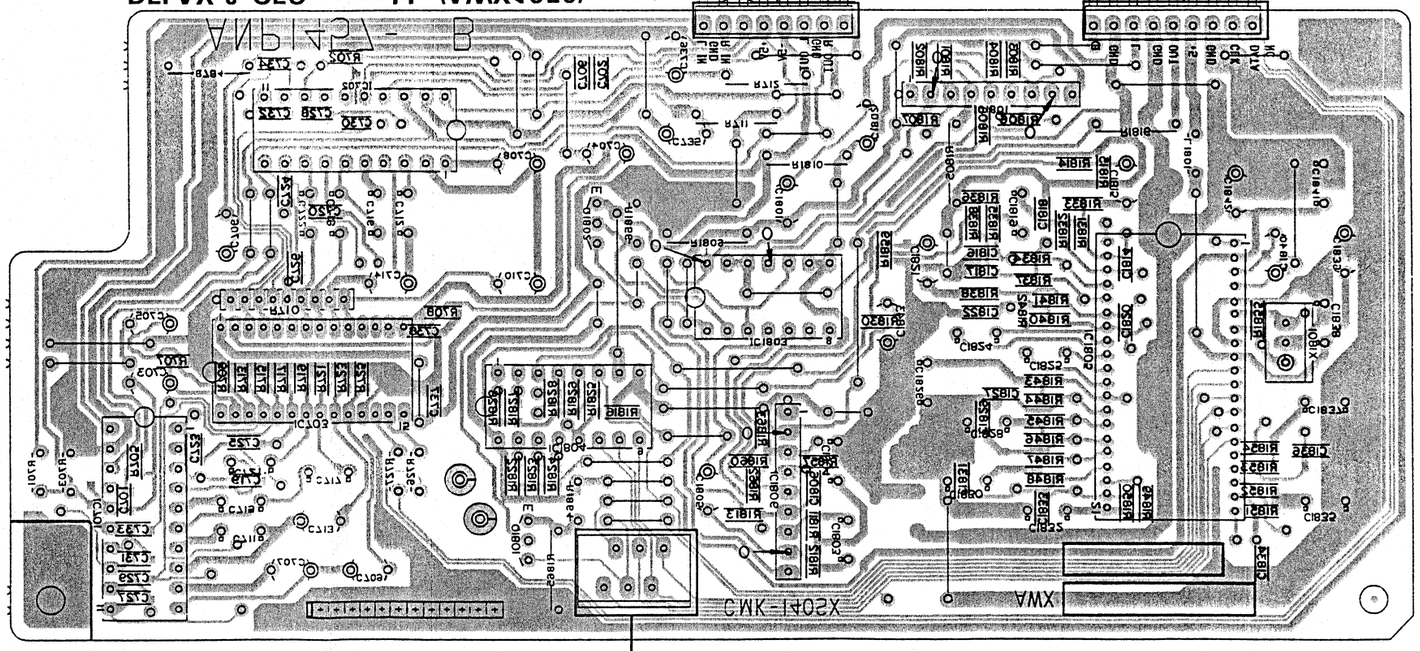
J MECHA assembly



To AE assembly CN4 (To page 32)

To AE assembly CN5 (To page 32)

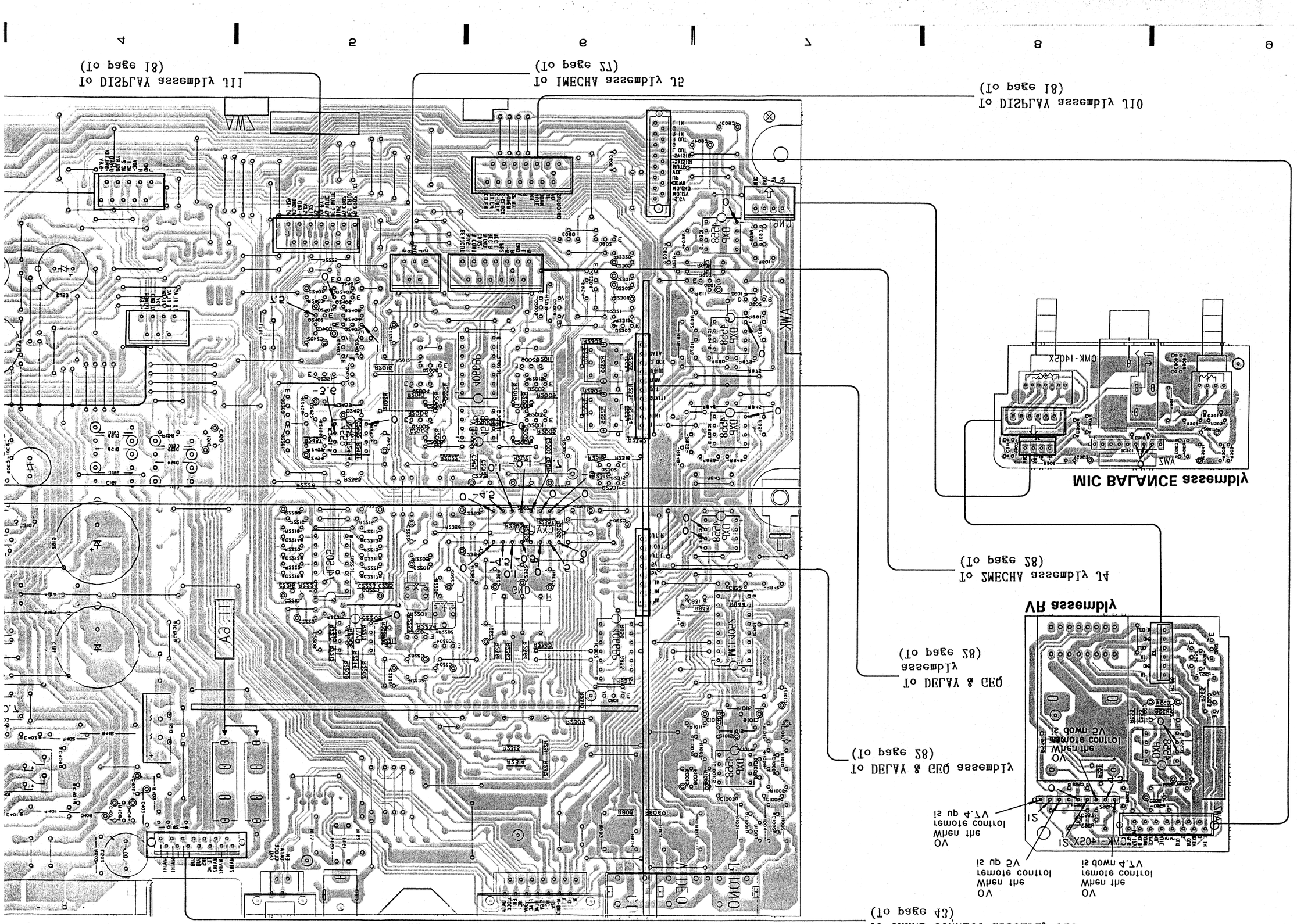
DELAY & GEQ assembly (AWX1020)

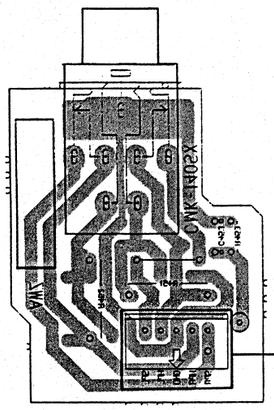


To AE assembly (To page 32)

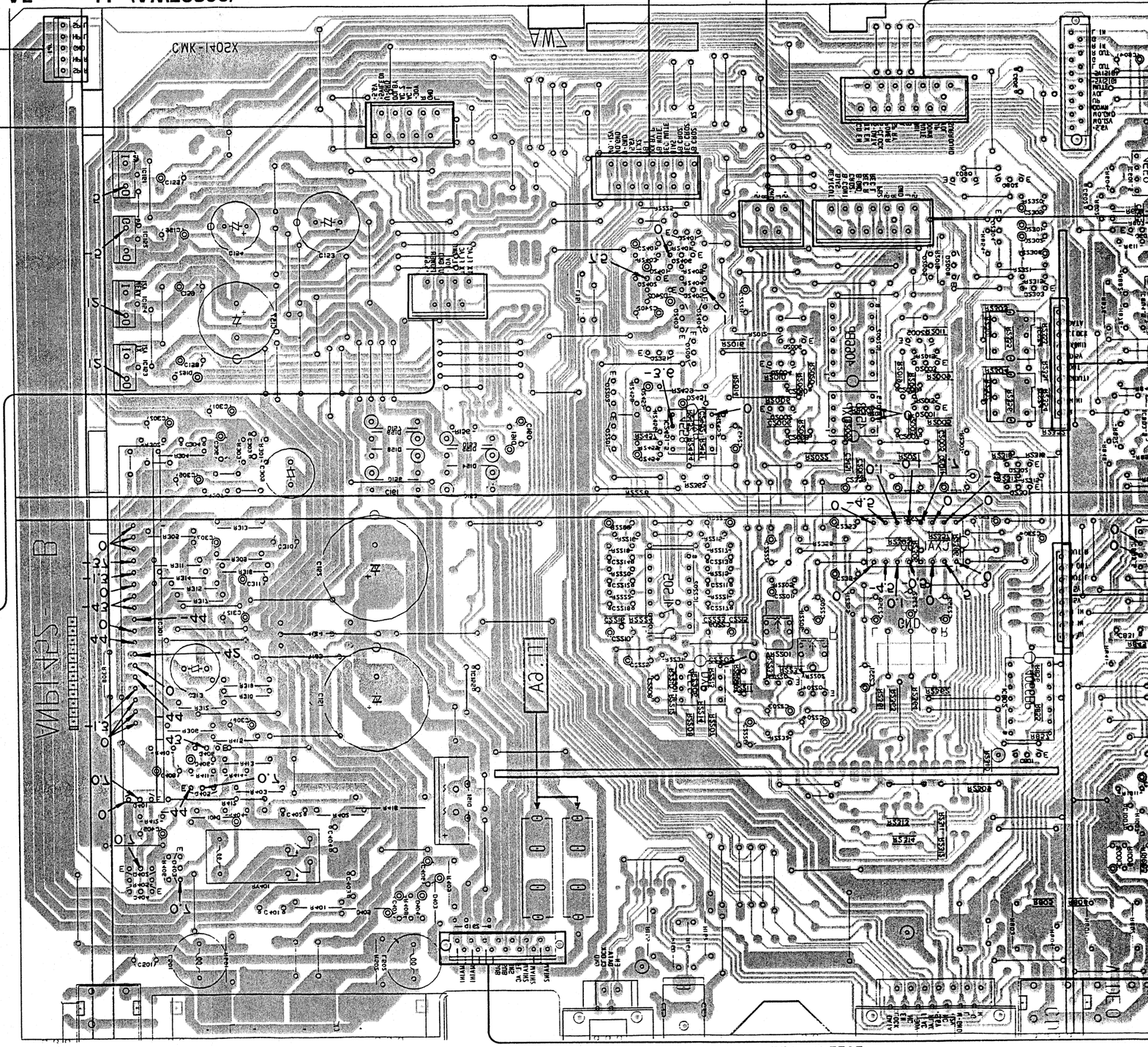
To AE assembly (To page 32)

To DISPLAY assembly CN3 (To page 18)


MIC BALANCE assembly
RV assembly
CWK-140SX
To DISPLAY assembly (To page 8I)
To SMECHA assembly (To page 8I)
To DISPLAY assembly (To page 8L)
To SMECHA assembly (To page 8L)
To DELAY & GEO assembly (To page 8L)
To DELAY & GEO assembly (To page 8L)
To TRANS CONNECT assembly (To page 8J)



HEAD PHONE assemplv



AT assemplv (AWZ333B)

To DISPLAY assemplv LLL (To page 8I)

To IMECHA assemplv 12 (To page 15)

To DISPLAY assemplv LLS (To page 8I)

To SUB TRANS assemplv CN15 (To page 44)

2.4 AF (AWZ3339), HEAD PHONE, VR and MIC BALANCE assembly

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 E	E or E	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513		Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

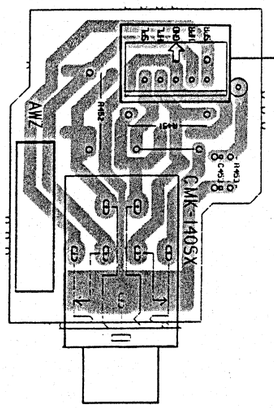
P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

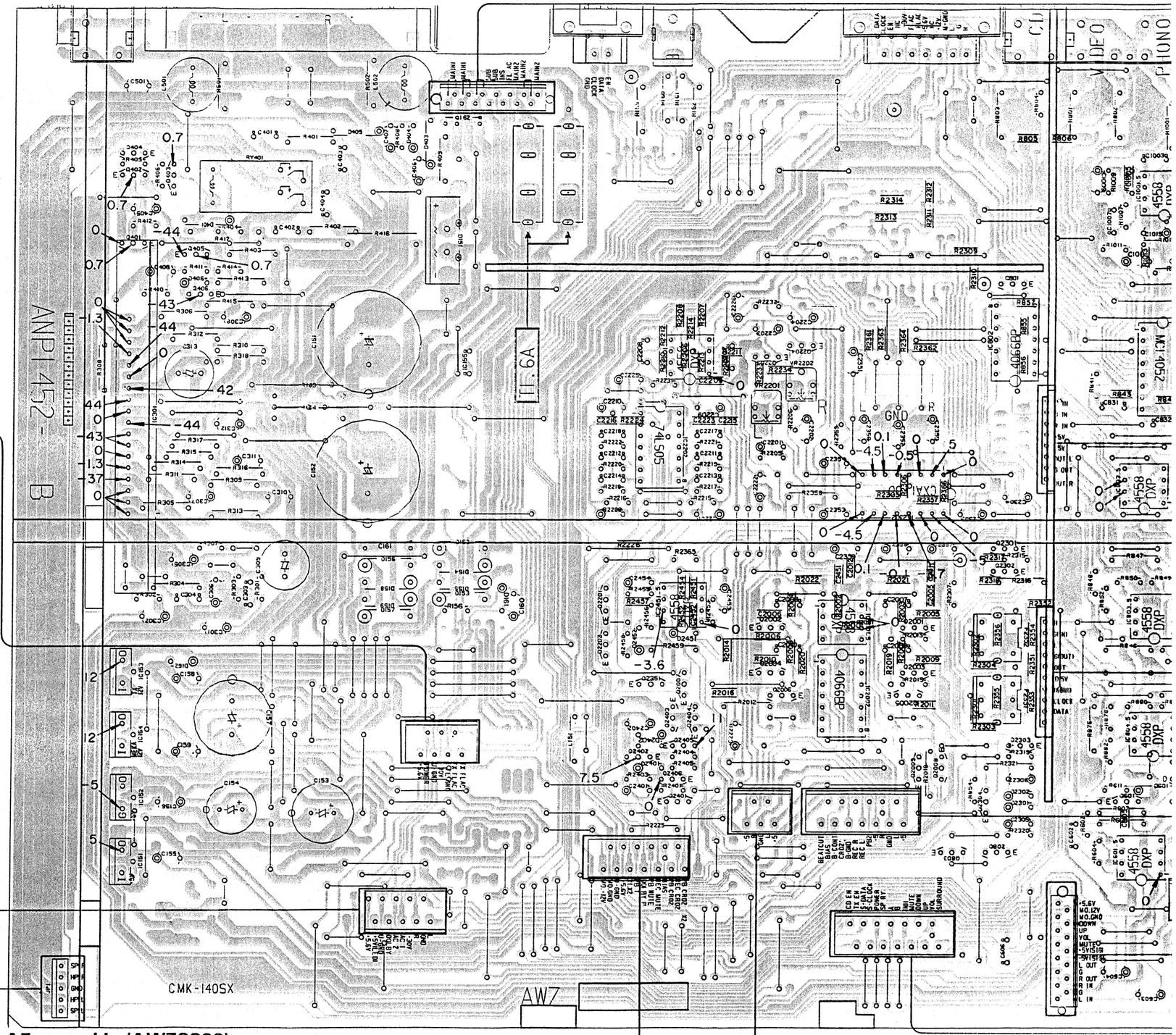
3. The capactor terminal marked with ◎(double circles) shows negatine termianl.
4. The diode terminal marked with ◎(double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

To SUB TRANS assembly CN16
(To page 44)

To DISPLAY assembly J12
(To page 19)

HEAD PHONE assembly





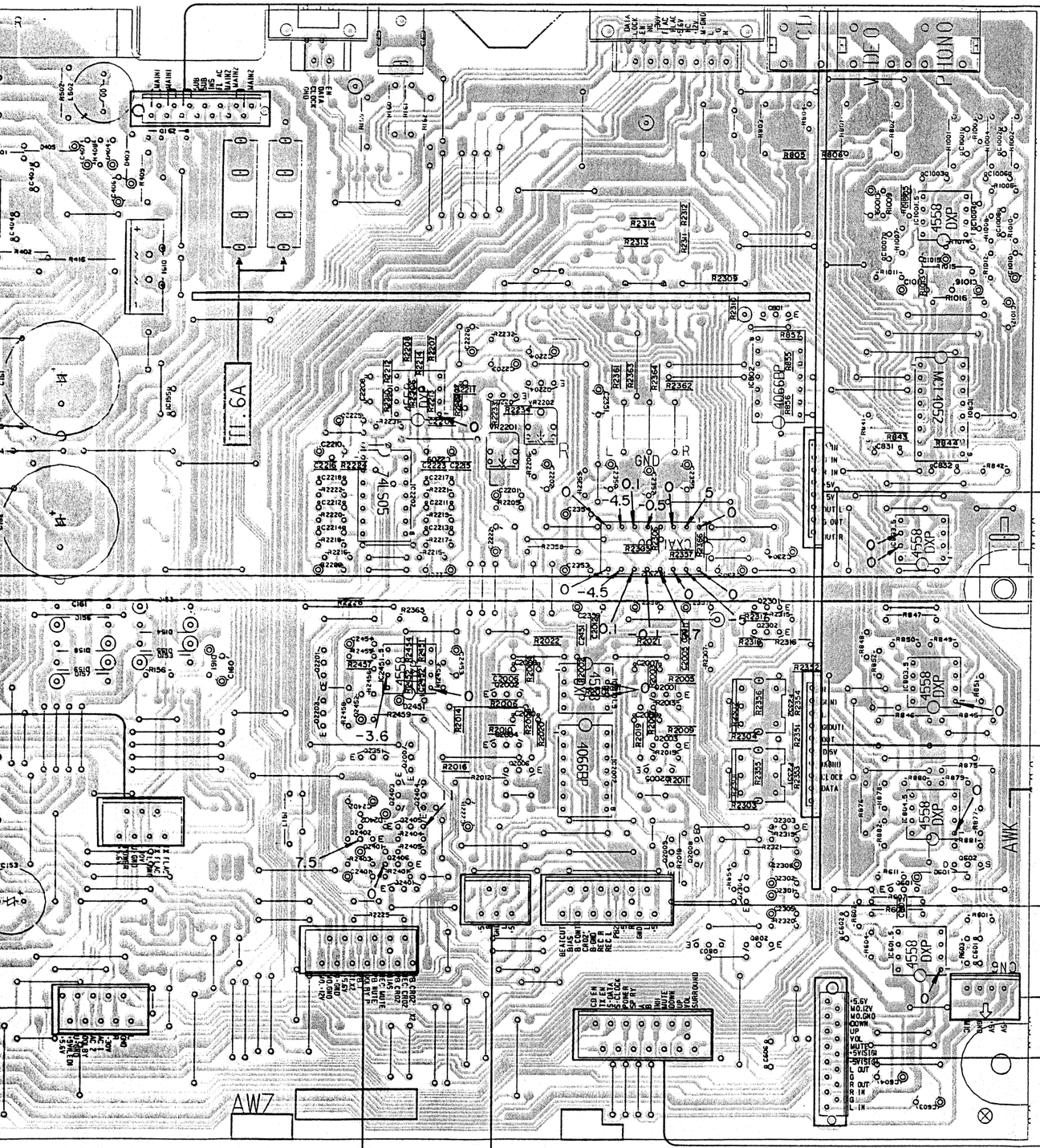
AF assembly (AWZ3339)

To DISPLAY assembly J11
(To page 18)

To 1MECHA assembly J5
(To page 27)

IC155 IC2202 IC2201 Q2203 Q2204 IC2302 Q801 IC802 IC1001 IC833 IC801
Q2201 Q2202 Q2351 Q2007 IC2451 Q2001–Q2006 IC2001 Q2301 Q2302 IC803 IC1804
Q2401–Q2406 IC2002 Q2009 Q2008 Q803 Q802 Q2304 Q2303 Q601 Q602 IC601

VR2201 VR2202



To TRANS CONNECT assembly J15
(To page 43)

To DELAY & GEQ assembly
(To page 28)

To DELAY & GEQ assembly
(To page 28)

To 2MECHA assembly J4
(To page 28)

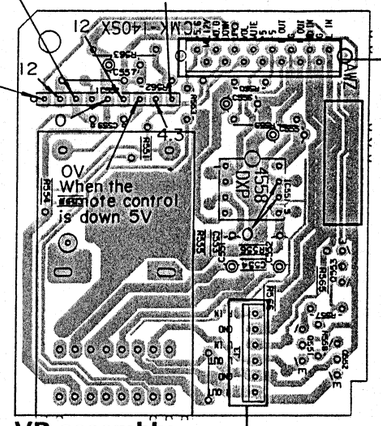
OV When the remote control is up 5V

OV When the remote control is down 4.7V

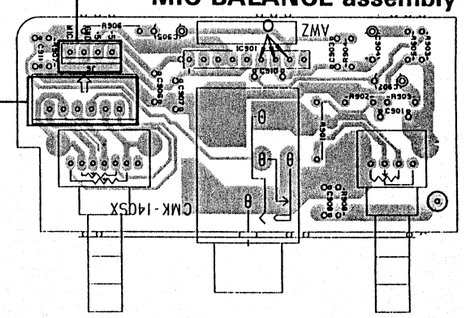
OV When the remote control is up 4.7V

OV When the remote control is down 5V

VR assembly



MIC BALANCE assembly



To DISPLAY assembly J11
(To page 18)

To 1MECHA assembly J5
(To page 27)

To DISPLAY assembly J10
(To page 18)

A

B

C

D

To DISPLAY assembly J10 (To page 21)
To DELAY & GEQ assembly CN1 (To page 26)
To DELAY & GEQ assembly CN14 (To page 26)

TUNER

CD

MIC BALANCE assembly

IC901:MIC AMP

IC901 NJM4558S-X

VR assembly

IC552:VOLUME CO

IC551:VOLUME AMP

Q551·Q552: MUTE

Q553:MUTE CONTROL

IC551	RC4558DXP
IC552	TA7291S
Q551·552	2SC2878
Q553	RN2203

AF assembly (AWZ3339)

IC1001:PHONO EQ AMP

PHONO

VTR

CD

IC833:BUFFER

IC801·IC802:FUNCTION

Q801:CONTROL

+5.6V

IC601·Q601·Q602:SURROUND

IC803:MIC MIX

IC804:DELAY MIX

Q802·Q803:CONTRPL

IC2002:PB MECHA 1/2 SELECTOR

To DISPLAY assembly J11 (To page 21)

To 1 MECHA assembly J5 (To page 24)

To 2 MECHA assembly J4 (To page 24)

Q2007:MUTE SW

Q2005·Q2006:PB MUTE

IC2451:MS PULSE

Q2008·Q2009:IC2002 CONTROL

IC2001·Q2001-Q2004:PB EQ

Q2401-Q2405:FADER

Q2201:x2 CONTROL

IC2201·IC2202:REC AMP

7 8 9 10 11

VOLUME CONTROL IC552

To DISPLAY assembly J12
(To page 22)

IC301:POWER AMP

HEADPHONE assembly

PHONES

FRONT SPEAKER Lch Rch 21V/8Ω

REAR SPEAKER Lch Rch

Q401-Q406:PROTECTION

To SUB TRANSE assembly J15
(To page 41)

To TRANS CONNECT assembly J15
(To page 41)

Q2203, Q2204: REC MUTE

Q2202:MUTE CONTROL

IC151-IC154:REGULATOR

IC2302	CXA1100P	Q2402	DTA124ES	Q2005, 2006, 2203, 2SC2878	
IC155	ICP-N75	Q2401	DTC124ES	Q2204	
IC801	MC14052BCP	Q2009, 2201	RN1201	Q602	2SK246
IC153, 154	MC7812CT	Q404, 802	RN1203		
IC151	NJM78M05FA	Q2008	RN2201		
IC152	NJM79M05FA	Q601, 801, 803,	RN2203	D151	D3SBA20
IC601, 803, 804,	RC4558DXP	Q2007, 2202, 2351		D401	RD22EB
IC833, 1001, 2001,		Q406	2SA1048	D2401	RD6.8ESB
IC2201, 2451		Q2405	2SA1115	D161, 405	RD6.8ESB2
IC2202	SN74LS05N	Q401-403, 405,	2SC2458	D152-159, 403	1SR139-400
IC301	STK4192-26P	Q2001-2004,		D162, 404, 406	1SS252
IC802, 2002	TC4066BP	Q2301-2304, 2406		D601, 2301, 2302,	
		Q2403, 2404	2SC2603	D2402, 2451, 2452	

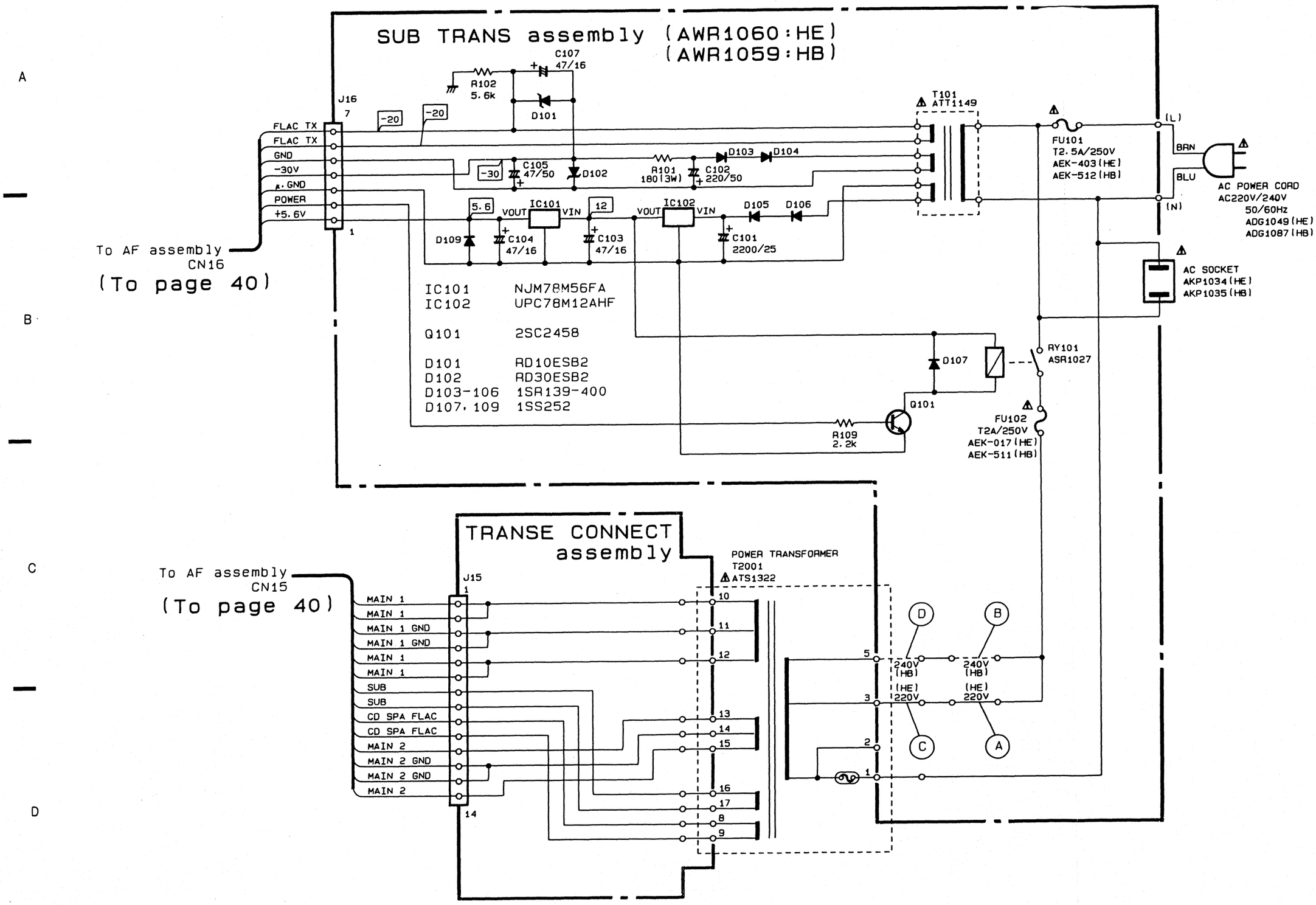
PLAY
REC

A B C D

40

7 8 9 10 11 12

2.5 SUB TRANS (AWR1060) and TRANS CONNECT assembly



Line Voltage Selection
(For HE, HB and HEWZIW types)

Line voltage can be changed with the following steps.

1. Disconnect the AC Power cord.
2. Remove the top cover.
3. Change the position of the jumper wires (A) – (D) as follows ;

Jumper wire \ Voltage	220V	240V
(A)	○	×
(B)	×	○
(C)	○	×
(D)	×	○

○ : Be needed
× : Be needless

4. Stick the line voltage label on the rear panel.

Description	Part No.
220V lavel	AAX–193
240V label	AAX–192

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

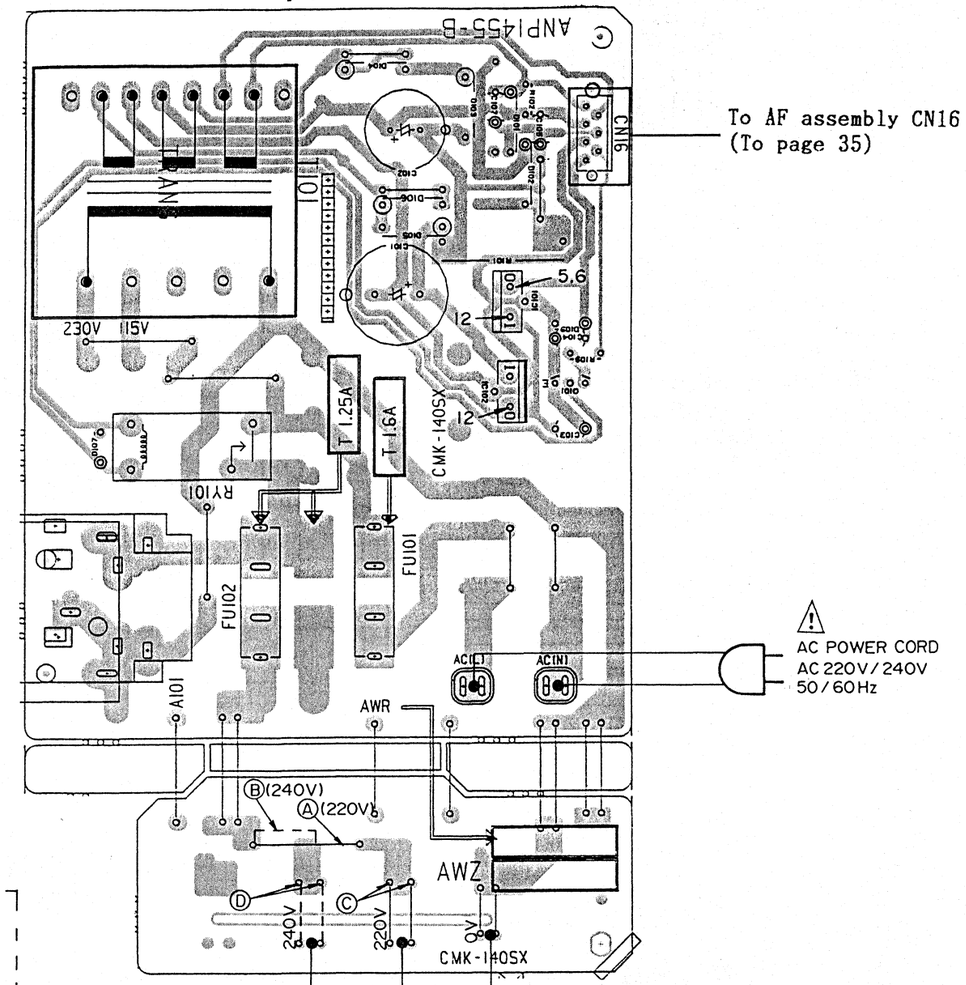
P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 E	E or E	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513		Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

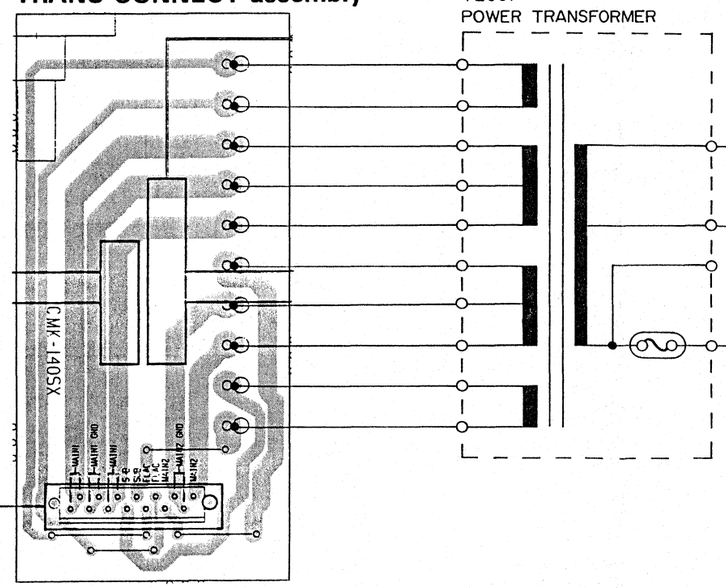
P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

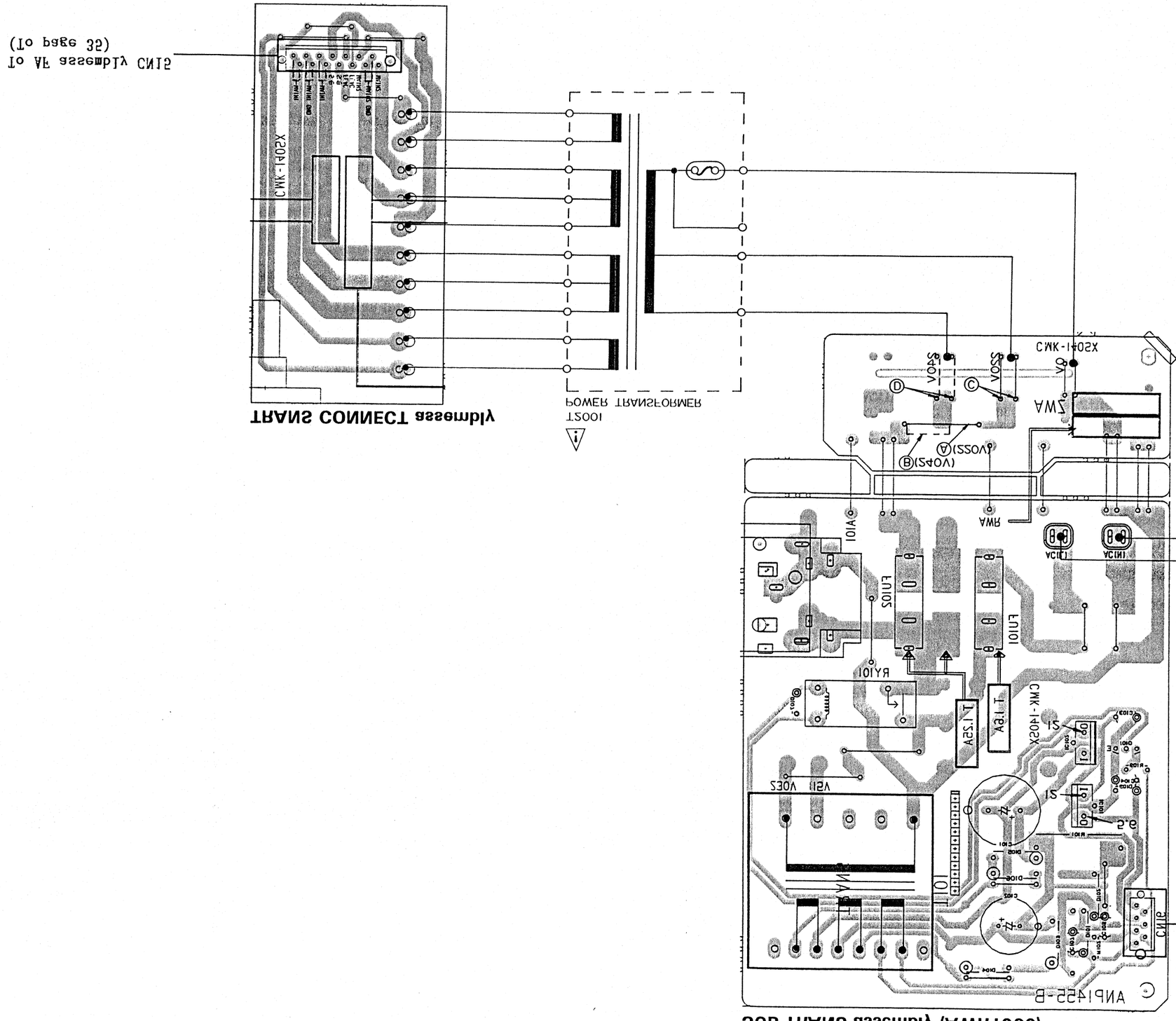
3. The capactor terminal marked with ⓞ(double circles) shows negatine termianl.
4. The diode terminal marked with ⓞ(double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

SUB TRANS assembly (AWR1060)



TRANS CONNECT assembly




(To page 35)
To AT assembly CN12
CWK-1402X
TRANS CONNECT assembly
POWER TRANSFORMER
T5001
CWK-1402X
VOSS
VOAS
VO
(VOSS)A
(VOAS)B
PWR
AC(L)
AC(N)
AC POWER CORD
50/60Hz
AC 220V/240V
RY101
F5102
F5101
T1.25A
T1.6A
VSW VOES
SW101
CN18
(To page 35)
To AT assembly CN18
SUB TRANS assembly (AWR1060)

3. P.C.B 's PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

Mark	No.	Description	Parts No.
◉ **AF ASSEMBLY (AWZ3339)**			
SEMICONDUCTORS			
	IC1001	OP–AMP IC	RC4558DXP
	IC151	REGULATOR IC	NJM78M05FA
	IC152	REGULATOR IC	NJM79M05FA
	IC153, 154	REGULATOR IC	MC7812CT
	IC155	IC PROTECTOR	ICP–N75
	IC2001	OP–AMP IC	RC4558DXP
	IC2002	LOGIC IC	TC4066BP
	IC2201	OP–AMP IC	RC4558DXP
	IC2202	LOGIC IC	SN74LS05N
	IC2302	DOLBY–B IC	CXA1100P
	IC2451	OP–AMP IC	RC4558DXP
	IC301	AUDIO IC	STK4192–2GP
	IC601	OP–AMP IC	RC4558DXP
	IC801	LOGIC IC	MC14052BCP
	IC802	LOGIC IC	TC4066BP
	IC803, 804	OP–AMP IC	RC4558DXP
	IC833	OP–AMP IC	RC4558DXP
	Q2001–2004	TRANSISTOR	2SC2458
	Q2005, 2006	TRANSISTOR	2SC2878
	Q2007	TRANSISTOR	RN2203
	Q2008	TRANSISTOR	RN2201
	Q2009, 2201	TRANSISTOR	RN1201
	Q2202	TRANSISTOR	RN2203
	Q2203, 2204	TRANSISTOR	2SC2878
	Q2301–2304	TRANSISTOR	2SC2458
	Q2351	TRANSISTOR	RN2203
	Q2401	TRANSISTOR	DTC124ES
	Q2402	TRANSISTOR	DTA124ES
	Q2403, 2404	TRANSISTOR	2SC2603
	Q2405	TRANSISTOR	2SA1115
	Q2406	TRANSISTOR	2SC2458
	Q401–403	TRANSISTOR	2SC2458
	Q404	TRANSISTOR	RN1203
	Q405	TRANSISTOR	2SC2458
	Q406	TRANSISTOR	2SA1048
	Q601	TRANSISTOR	RN2203
	Q602	N–FET	2SK246
	Q801	TRANSISTOR	RN2203
	Q802	TRANSISTOR	RN1203
	Q803	TRANSISTOR	RN2203
	D151	DIODE	D3SBA20 (A)
	D152–159	DIODE	1SR139–400
	D161	ZENER DIODE	RD6.8ESB2
	D162, 2301	DIODE	1SS252
	D2302	DIODE	1SS252
	D2401	ZENER DIODE	RD6.8ESB
	D2402, 2451	DIODE	1SS252
	D2452	DIODE	1SS252
	D401	ZENER DIODE	RD22EB
	D403	DIODE	1SR139–400
	D404	DIODE	1SS252
	D405	ZENER DIODE	RD6.8ESB2
	D406, 601	DIODE	1SS252
RELAY			
	RY401	RELAY	ASR1035
COILS			
	L151	AXIAL INDUCTOR	LAU2R2K
	L2201, 2202	INDUCTOR	LTA392J
	L501, 502	COIL	ATH–133
	F2351, 2352	DOLBY FILTER	ATF1064
CAPACITORS			
	C1001–1004	CERAMIC CAPACITOR	CCMSL101J50
	C1005	CERAMIC CAPACITOR	CKSQYB152K50
	C1006	CERAMIC CAPACITOR	CKDYB152K50
	C1007, 1008	CERAMIC CAPACITOR	CKDYB562K50
	C1009–1012	ELECTR.CAPACITOR	CEAS2R2M50
	C1015, 1016	ELECTR.CAPACITOR	CEAS470M16
	C151, 152	ELECTROLYTIC CAPACIT	ACH–252
	C153	ELECTR.CAPACITOR	CEAS222M16
	C154	ELECTR.CAPACITOR	CEAS102M16
	C155, 156	ELECTR.CAPACITOR	CEAS220M16
	C157	ELECTR.CAPACITOR	CEAS222M25
	C158, 159	ELECTR.CAPACITOR	CEAS220M25
	C160	ELECTR.CAPACITOR	CEAS100M25
	C161	CERAMIC CAPACITOR	CKDYB103K500
	C162	CKA (0.01/AC250V)	ACG1005
	C2007, 2008	MYLOR FILM CAPACITOR	CQMA273J50
	C2009, 2010	MYLOR FILM CAPACITOR	CQMA183J50
	C2011, 2012	CERAMIC CAPACITOR	CKSQYB152K50
	C2201–2204	ELECTR.CAPACITOR	CEAS010M50
	C2205, 2206	CHIP CAPACITOR	CKSQYB222K50
	C2207, 2208	AUDIO FILM CAPACITOR	CFTXA104J50
	C2209, 2210	ELECTR.CAPACITOR	CEAS330M16
	C2211, 2212	CERAMIC CAPACITOR	CKCYX183M25
	C2213, 2214	MYLOR FILM CAPACITOR	CQMA752J50
	C2215, 2216	CERAMIC CAPACITOR	CKSQYB562K50
	C2217, 2218	MYLOR FILM CAPACITOR	CQMA273J50
	C2221, 2222	ELECTR.CAPACITOR	CEAS2R2M50
	C2225, 2226	ELECTR.CAPACITOR	CEAS470M16
	C2303	ELECTR.CAPACITOR	CEAS010M50
	C2304	ELECTR.CAPACITOR	CEJA010M50
	C2305	ELECTR.CAPACITOR	CEAS220M16
	C2306	ELECTR.CAPACITOR	CEAS220M25
	C2351, 2352	ELECTR.CAPACITOR	CEAS100M50
	C2353, 2354	ELECTR.CAPACITOR	CEASR22M50
	C2355	ELECTR.CAPACITOR	CEAS101M10
	C2356–2359	ELECTR.CAPACITOR	CEAS100M50
	C2401	ELECTR.CAPACITOR	CEAS331M16
	C2402	ELECTR.CAPACITOR	CEAS100M25
	C2451	CERAMIC CAPACITOR	CKSQYB473K50
	C2452	CERAMIC CAPACITOR	CCSQCH560J50
	C2453	ELECTR.CAPACITOR	CEAS010M50
	C2454	ELECTR.CAPACITOR	CEAS0R1M50
	C301, 302	ELECTR.CAPACITOR	CEAS2R2M50
	C303, 304	CERAMIC CAPACITOR	CKMYB331K50
	C305, 306	ELECTR.CAPACITOR	CEAS220M50
	C307, 308	ELECTR.CAPACITOR	CEAS101M25
	C309	ELECTR.CAPACITOR	CEANP220M50
	C310	ELECTR.CAPACITOR	CEANP100M50
	C311, 312	ELECTR.CAPACITOR	CEAS100M50
	C313	ELECTROLYTIC CAPACIT	ACH1143
	C401–404	CERAMIC CAPACITOR	CKCYF473Z50
	C405	ELECTR.CAPACITOR	CEAS221M16
	C406	ELECTR.CAPACITOR	CEAS220M25
	C407	ELECTR.CAPACITOR	CEAS221M16
	C408	ELECTR.CAPACITOR	CEAS100M50
	C501	ELECTR.CAPACITOR	ACH1144
	C601, 602	CERAMIC CAPACITOR	CKMYB471K50
	C603, 604	ELECTR.CAPACITOR	CEAS2R2M50
	C605	CERAMIC CAPACITOR	CKSQYB681K50
	C606	CERAMIC CAPACITOR	CKCYF473Z50
	C831, 832	CERAMIC CAPACITOR	CCMSL101J50
RESISTORS			
	VR2201,2202	VR	VRTB6VS222
	R1013	CHIP RESISTOR	RS1/10S104J
	R159–162	CARBON FILM RESISTOR	RD1/4PM100J
	R163, 164	METAL OXIDE RESISTOR	RS2LMFR22J
	R2001, 2002	CHIP RESISTOR	RS1/10S103J
	R2003, 2004	CHIP RESISTOR	RS1/10S122J
	R2005, 2006	CHIP RESISTOR	RS1/10S105J
	R2007, 2008	CHIP RESISTOR	RS1/10S332J
	R2009, 2010	CHIP RESISTOR	RS1/10S105J
	R2011	CHIP RESISTOR	RS1/10S472J
	R2014	CHIP RESISTOR	RS1/10S472J
	R2016	CHIP RESISTOR	RS1/10S472J
	R2019, 2020	CHIP RESISTOR	RS1/10S154J
	R2021, 2022	CHIP RESISTOR	RS1/10S222J
	R2207, 2208	CHIP RESISTOR	RS1/10S104J
	R2209, 2210	CHIP RESISTOR	RS1/10S683J
	R2211, 2212	CHIP RESISTOR	RS1/10S223J
	R2213, 2214	CHIP RESISTOR	RS1/10S333J
	R2223, 2224	CHIP RESISTOR	RS1/10S471J
	R2226	CHIP RESISTOR	RS1/10S681J
	R2233, 2234	CHIP RESISTOR	RS1/10S102J
	R2301, 2302	CHIP RESISTOR	RS1/10S273J
	R2303, 2304	CHIP RESISTOR	RS1/10S362J
	R2305, 2306	CHIP RESISTOR	RS1/10S103J
	R2317, 2318	CHIP RESISTOR	RS1/10S222J
	R2351, 2352	CHIP RESISTOR	RS1/10S242J
	R2355, 2356	CHIP RESISTOR	RS1/10S682J
	R2357	CHIP RESISTOR	RS1/10S433J
	R2361, 2362	CHIP RESISTOR	RS1/10S222J
	R2363, 2364	CHIP RESISTOR	RS1/10S273J
	R2366	CHIP RESISTOR	RS1/10S103J
	R2451	CHIP RESISTOR	RS1/10S224J
	R2452	CHIP RESISTOR	RS1/10S154J
	R2454	CHIP RESISTOR	RS1/10S223J
	R2457	CHIP RESISTOR	RS1/10S123J
	R305, 306	CARBON FILM RESISTOR	RD1/4PM104J

Mark	No.	Description	Parts No.
	C707, 708	ELECTROLYTIC CAPACIT	CEASR15M50
	C709	ELECTR.CAPACITOR	CEASR47M50
	C710	ELECTROLYTIC CAPACIT	CEJAR47M50
	C711, 712	CERAMIC CAPACITOR	CKCYX683M16
	C713, 714	ELECTROLYTIC CAPACIT	CEASR15M50
	C715, 716	CERAMIC CAPACITOR	CKCYX273M16
	C717, 718	CERAMIC CAPACITOR	CKCYX683M16
	C719, 720	CERAMIC CAPACITOR	CKSQYB103K50
	C721, 722	CERAMIC CAPACITOR	CKCYX273M16
	C723, 724	CERAMIC CAPACITOR	CKSQYB472K50
	C725, 726	CERAMIC CAPACITOR	CKSQYB103K50
	C727, 728	CERAMIC CAPACITOR	CKSQYB182K50
	C729, 730	CERAMIC CAPACITOR	CKSQYB472K50
	C731, 732	CERAMIC CAPACITOR	CKSQYB681K50
	C733, 734	CERAMIC CAPACITOR	CKSQYB182K50
	C735, 736	ELECTR.CAPACITOR	CEAS101M10
	C737, 738	CERAMIC CAPACITOR	CKSQYB473K50
RESISTORS			
	R1805	CARBON FILM RESISTOR	RD1/8PM682J
	R1809, 1810	CARBON FILM RESISTOR	RD1/4PM390J
	R1816	CARBON FILM RESISTOR	RD1/8PM272J
	R1856	CARBON FILM RESISTOR	RD1/8PM472J
	R1864	CARBON FILM RESISTOR	RD1/8PM102J
	R1865	CARBON FILM RESISTOR	RD1/4PM222J
	R701	CARBON FILM RESISTOR	RD1/8PM103J
	R703, 704	CARBON FILM RESISTOR	RD1/8PM223J
	R710	RESISTOR ARRAY (1M)	RA8T105J
	R711,712	CARBON FILM RESISTOR	RD1/4PM390J
		Other resistors	RS1/10S□□□J
OTHERS			
	X1801	CERAMIC OSCILLATOR	ASS1016
	CN13	CONNECTOR (6P)	KPE6

TRANS CONNNECT ASSEMBLY

No parts are supplied with the TRANS CONNECT assembly.

Mark	No.	Description	Parts No.

VR ASSEMBLY

SEMICONDUCTORS

	IC551	OP–AMP IC	RC4558DXP
	IC552	MECHANISM DRIVER IC	TA7291S
	Q551, 552	TRANSISTOR	2SC2878
	Q553	TRANSISTOR	RN2203

CAPACITORS

	C551, 552	ELECTR.CAPACITOR	CEAS4R7M50
	C553, 554	CHIP CAPACITOR	CCSQCH101J50
	C555, 556	ELECTR.CAPACITOR	CEAS101M16
	C557	ELECTR.CAPACITOR	CEAS220M25
	C558	CERAMIC CAPACITOR	CKSQYF104Z50
	C559	CERAMIC CAPACITOR	CKCYF473Z50

RESISTORS

	VR551	VARIABLE RESISTOR	ACX1051
	R554	CHIP RESISTOR	RS1/10S000J
	R555, 556	CHIP RESISTOR	RS1/10S104J
	R561	CHIP RESISTOR	RS1/10S000J
	R565, 566	CHIP RESISTOR	RS1/10S102J
		Other resistors	RD1/8PM□□□J

HEAD PHONE ASSEMBLY

CAPACITORS

	C453	CERAMIC CAPACITOR	CKDYF473Z50

RESISTORS

	R451, 452	METAL OXIDE RESISTOR	RS2LMF331J
	R453	CARBONFILM RESISTOR	RD1/8PM100J

OTHERS

		JACK (HEAD PHONE)	AKN1010
	CN1	CONNECTOR (5P)	KPC5

⊙ DISPLAY ASSEMBLY (AWZ3352)

SEMICONDUCTORS

	IC1501	LOGIC IC	SN74LS05N
	IC1502	LOGIC IC	SN74LS03N
	IC1503	GEQ–BPF IC	BA3826S
	IC1504	OP–AMP IC	RC4558DXP
	IC1505		PD3180A
	IC1651	SYSTEM CONTROL μ–COM	PD5147B
	IC1652	RESET IC	M51951BSL

Mark	No.	Description	Parts No.
	R309-312	CARBON FILM RESISTOR	RD1/4PM222J
	R313	CARBON FILM RESISTOR	RD1/4PMFL471J
	R314	CARBON FILM RESISTOR	RD1/4PMFL101J
	R315	CARBON FILM RESISTOR	RD1/4PM102J
	R316, 317	CARBON FILM RESISTOR	RD1/4PMFL222J
	R318	CARBON FILM RESISTOR	RD1/4PMFL101J
	R401, 402	CARBON FILM RESISTOR	RD1/4PM100J
	R409	CARBON FILM RESISTOR	RD1/2PM182J
	R416, 417	METAL OXIDE RESISTOR	RS2LMF391J
	R501, 502	CARBON FILM RESISTOR	RD1/4PMFL100J
	R805, 806	CHIP RESISTOR	RS1/10S273J
	R843, 844	CHIP RESISTOR	RS1/10S223J
	R855, 856	CHIP RESISTOR	RS1/10S332J
	R857	CHIP RESISTOR	RS1/10S104J
		Other resistors	RD1/8PM□□□J
OTHERS			
	CN10	CONNECTOR (14P)	KPE14
	CN11	CONNECTOR (15P)	KPE15
	CN12	CONNECTOR (13P)	KPE13
	CN16	CONNECTOR (7P)	KPE7
	CN4	CONNECTOR (13P)	KPE13
	CN5	CONNECTOR (5P)	KPE5
	CN6	CONNECTOR (4P)	KPC4
		PIN JACK (6P)	AKB1121
		PIN JACK (2P)	AKB1146
		SPEAKER TERMINAL (4-P)	AKE-109
		JACK	AKN-203
		SOCKET (4P)	AKP1046
		SOCKET (14P)	AKP1048
⊙		DELAY & GEQ ASSEMBLY	AWX1050

⊙ DELAY & GEQ ASSEMBLY (AWX1050)

The DELAY & GEQ assembly (AWX1050) is a part of AF assembly (AWZ3339).

SEMICONDUCTORS

IC1801	OP-AMP IC	NJM4558S-X
IC1803	LOGIC IC	TC4066BP
IC1804	LOGIC IC	MC14051BCP
IC1805	IC	M50194P
IC1806	OP-AMP IC	NJM4558S-X

Mark	No.	Description	Parts No.
	IC701, 702	GEQ IC	LA3607
	IC703	GEQ EVR IC	LC7522
	Q1801	TRANSISTOR	DTA124ES
	Q1802	TRANSISTOR	DTC124ES
COIL			
	L1801	AXIAL INDUCTOR	LAU330K
CAPACITORS			
	C1801, 1802	ELECTR.CAPACITOR	CEAS470M16
	C1803	AUDIO FILM CAPACITOR	CFTXA683J50
	C1804	AUDIO FILM CAPACITOR	CFTXA105J50
	C1805	ELECTR.CAPACITOR	CEAS010M50
	C1806	CERAMIC CAPACITOR	CKSQYB473K50
	C1807	CHIP CAPACITOR	CKSQYF104K50
	C1814	CERAMIC CAPACITOR	CKSQYB561K50
	C1815	ELECTR.CAPACITOR	CEAS010M50
	C1816, 1817	CERAMIC CAPACITOR	CKSQYB103K50
	C1818	CERAMIC CAPACITOR	CKSQYB562K50
	C1819	ELECTR.CAPACITOR	CEANP010M50
	C1820	CERAMIC CAPACITOR	CKSQYB561K50
	C1821	ELECTR.CAPACITOR	CEAS010M50
	C1822	CERAMIC CAPACITOR	CKSQYB562K50
	C1823	CHIP CAPACITOR	CKSQYF104K50
	C1824, 1825	MYLOR FILM CAPACITOR	CQMA473J50
	C1826	AUDIO FILM CAPADITOR	CFTXA334J50
	C1827	CERAMIC CAPACITOR	CKSQYB103K50
	C1828	AUDIO FILM CAPADITOR	CFTXA334J50
	C1829	CERAMIC CAPACITOR	CKSQYB103K50
	C1830	AUDIO FILM CAPADITOR	CFTXA334J50
	C1831	CERAMIC CAPACITOR	CKSQYB103K50
	C1832	AUDIO FILM CAPADITOR	CFTXA334J50
	C1833, 1834	CERAMIC CAPACITOR	CKSQYB103K50
	C1835	AUDIO FILM CAPADITOR	CFTXA334J50
	C1836	CERAMIC CAPACITOR	CKSQYB103K50
	C1837	AUDIO FILM CAPADITOR	CFTXA334J50
	C1838	CERAMIC CAPACITOR	CKCYX104M25
	C1839	ELECTR.CAPACITOR	CEAS101M25
	C1840	ELECTR.CAPACITOR	CEAS470M25
	C1841	CERAMIC CAPACITOR	CKCYX104M25
	C1842	ELECTR.CAPACITOR	CEAS101M25
	C1843	ELECTR.CAPACITOR	CEAS100M50
	C701, 702	CERAMIC CAPACITOR	CCSQSL331J50
	C703-706	ELECTR.CAPACITOR	CEAS2R2M50

Mark	No.	Description	Parts No.
	Q1501-1504	TRANSISTOR	RN1201
	Q1505-1507	TRANSISTOR	RN1203
	Q1508, 1509	TRANSISTOR	RN2201
	Q1511	TRANSISTOR	RN1201
	Q1601	TRANSISTOR	RN2204
	Q1602	TRANSISTOR	RN1203
	Q1603	TRANSISTOR	RN2204
	Q1604	TRANSISTOR	2SA1515
	Q1605	TRANSISTOR	RN1203
	Q1606	TRANSISTOR	2SA1515
	Q1607	TRANSISTOR	RN1203
	Q1608	TRANSISTOR	2SA1515
	Q1609	TRANSISTOR	RN1203
	Q1610	TRANSISTOR	2SA1515
	Q1611	TRANSISTOR	RN1203
	D1501-1504	LED (GREEN)	AEL1130
	D1505	LED (RED)	AEL1119
	D1506, 1507	LED (RED)	AEL1126
	D1508, 1509	LED	AEL1128
	D1510	LED (RED)	AEL1065
	D1511-1516	LED (RED)	AEL1108
	D1517, 1520	DIODE	1SS252
	D1521-1531	DIODE	1SS252
	D1533	LED	AEL1127
	D1535, 1537	DIODE	1SS252
	D1538-1543	DIODE	1SS252
	D1544, 1545	LED (GREEN)	AEL1129
	D1546	LED (RED)	AEL1065
	D1547, 1548	DIODE	1SS252
	D1601-1617	DIODE	1SS252
	D1651-1664	DIODE	1SS252
SWITCHES			
	S1504-1507	SWITCH	ASG1034
	S1510-1514	SWITCH	ASG1034
	S1516-1519	SWITCH	ASG1034
	S1522-1525	SWITCH	ASG1034
	S1528	SWITCH	ASD1012
	S1529	ROTARY ENCODER	ASX1009
	S1530-1544	SWITCH	ASG1034
	S1546-1549	SWITCH	ASG1034
COILS			
	L1501	AXIAL INDUCTOR	LAU221K
	L1651	AXIAL INDUCTOR	LAU220K
CAPACITORS			
	C1501	CERAMIC CAPACITOR	CKDYX473M16
	C1504	ELECTR.CAPACITOR	CEJA470M10
	C1505	CEA (47000/5.5V)	ACH1070
	C1506	CERAMIC CAPACITOR	ACG1022
	C1507	CERAMIC CAPACITOR	CCDSL100D50
	C1508	CERAMIC CAPACITOR	ACG1022
	C1509	CERAMIC CAPACITOR	CKMYB102K50
	C1510	CERAMIC CAPACITOR	CKDYX473M16
	C1601	ELECTR.CAPACITOR	CEAS470M10
	C1602	ELECTR.CAPACITOR	CEASR33M50
	C1651	CERAMIC CAPACITOR	CKCYF473Z50
	C1652	ELECTR. CAPACITOR	CEAS101M16
	C1653	ELECTR.CAPACITOR	CKCYF473Z50
	C1654-1658	CERAMIC CAPACITOR	ACG1020
	C1659	ELECTR.CAPACITOR	CEAS010M50
RESISTORS			
	VR1601, 1602	VR	VRTM6V203
	VR1603	VR	VRTM6V103
	R1543	RESISTOR ARRAY (100k)	RA13S104J
	R1544	RESISTOR ARRAY (100k)	RA15T104J
	R1662	RESISTOR ARRAY (3.3k)	RA8T332J
		Other resistors	RD1/8PM□□□J
OTHERS			
	X1502	CERAMIC RESONATOR	ASS1018
	X1651	CERAMIC RESONATOR	ASS1025
	V1501	FL TUBE	AAV1110
		REMOTE RECEIVER UNIT	AXX1010
	CN8	CONNECTOR (15P)	KPE15

1 MECHA SW ASSEMBLY

SWITCHES

	S1551-1555	SWITCH	ASG1034

2 MECHA SW ASSEMBLY

SWITCHES

	S1556-1560	SWITCH	ASG1034

MIC BALANCE ASSEMBLY

SEMICONDUCTORS

	IC901	OP-AMP IC	NJM4558S-X

CAPACITORS

	C901	CERAMIC CAPACITOR	CKMYB681K50
	C902	ELECTR.CAPACITOR	CEAS010M50
	C903	CERAMIC CAPACITOR	CKMYB471K50
	C904, 905	ELECTR.CAPACITOR	CEAS100M25
	C906, 907	CERAMIC CAPACITOR	CKDYX473M16
	C908	CERAMIC CAPACITOR	CKDYF473Z50

Mark	No.	Description	Parts No.
RESISTORS			
	VR552	VARIABLE RESISTOR	ACS1066
	VR901	VARIABLE (10k-X1)	ACS1065
		Other resistors	RD1/8PM□□□J
OTHERS			
	CN3	JUMPER CONNECTOR	KPC6
		JACK (MIC)	AKN1017

⊙ SUB TRANS ASSEMBLY (AWR1060)

SEMICONDUCTORS			
	IC101	REGULATOR IC	NJM78M56FA
	IC102	REGULATOR IC	UPC78M12AHF
	Q101	TRANSISTOR	2SC2458
	D101	ZENER DIODE	RD10ESB2
	D102	ZENER DIODE	RD30ESB2
	D103-106	DIODE	1SR139-400
	D107, 109	DIODE	1SS252
RELAY			
	RY101	RELAY	ASR1027
TRANSFORMER			
	T101	POWER TRANSFORMER	ATT1149
CAPACITORS			
	C101	ELECTR.CAPACITOR	CEAS222M25
	C102	ELECTR.CAPACITOR	CEAS221M50
	C103, 104	ELECTR.CAPACITOR	CEAS470M16
	C105	ELECTR.CAPACITOR	CEAS470M50
	C107	ELECTR.CAPACITOR	CEAS470M16
RESISTORS			
	R101	METAL OXIDE RESISTOR	RS3LMF181J
		Other resistors	RD1/8PM□□□J
OTHERS			
		AC SOCKET 1-P	AKP1034

1 MECHA ASSEMBLY

CAPACITORS			
	C2001, 2002	CERAMIC CAPACITOR	CKMYB391K50
	C2005, 2006	AUDIO FILM CAPACITOR	CFTXA223J50
	C2007, 2008	ELECTR.CAPACITOR	CEAS4R7M50
	C2009, 2010	ELECTR.CAPACITOR	CEAS470M10

Mark	No.	Description	Parts No.
RESISTORS			
	VR2001, 2002	VR	VRTM6H202
		Other resistors	RD1/8PM□□□J

2 MECHA ASSEMBLY

SEMICONDUCTORS			
	IC2001, 2021	OP-AMP IC	RC4558DXP
	Q2021, 2022	N-FET	2SK373
	Q2251	TRANSISTOR	RN1201
	Q2252	TRANSISTOR	2SA1515
	Q2253, 2254	TRANSISTOR	2SC3377
	Q2255	TRANSISTOR	2SC2458
	D2021-2026	DIODE	1SS252
COILS & TRANSFORMER			
	L2204, 2205	INDUCTOR	LTA822J
	T2251	OSC TRANSFORMER	ATX-043
CAPACITORS			
	C2021, 2022	CERAMIC CAPACITOR	CCMSL100D50
	C2023, 2024	CERAMIC CAPACITOR	CKMYB391K50
	C2027, 2028	AUDIO FILM CAPACITOR	CFTXA223J50
	C2029, 2030	ELECTR.CAPACITOR	CEAS4R7M50
	C2031, 2032	ELECTR.CAPACITOR	CEAS470M10
	C2219, 2220	CERAMIC CAPACITOR	CCDSL271K500
	C2223, 2224	CERAMIC CAPACITOR	CKDYB681K50
	C2251	ELECTR.CAPACITOR	CEAS470M16
	C2252, 2253	CERAMIC CAPACITOR	CGMYX103M16
	C2254	CERAMIC CAPACITOR	CKMYB221K50
	C2255	MYLOR FILM CAPACITOR	CQMA153K50
	C2256	CERAMIC CAPACITOR	CKMYB681K50
	C2257	MYLOR FILM CAPACITOR	CQMA123K250
	C2258	ELECTR.CAPACITOR	CEAS4R7M50
	C2259, 2260	CERAMIC CAPACITOR	CCCSL101K500
	C2261	MYLOR FILM CAPACITOR	CQMA562K400
	C2262	CQPA (2000p/630V)	ACE1020
	C2263	ELECTR.CAPACITOR	CEAS100M50
RESISTORS			
	VR2021, 2022	VR	VRTM6V202
	VR2251, 2252	VR	VRTM6H204
	R2253		RD1/2PM360J
		Other resistors	RD1/8PM□□□J

4. FOR HB TYPE

NOTES:
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

4.1 CONTRAST OF MISCELLANEOUS PARTS

The DC–Z94/HB type is the same as the DC–Z94/HE type with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		HE type	HB type	
⊙	SUB TRANS assembly	AWR1060	AWR1059	
⚠	FU101 (T2.5A/250V)	AEK–403	AEK–512	
⚠	FU102 (T2A/250V)	AEK–017	AEK–511	
⚠	FU151, FU152 (T800mA/250V)	AEK–031	AEK–507	
⚠	AC Power cord	ADG1049	ADG1087	
	Operating instructions (Nederlands, Svenska, Español, Português)	ARC1244	.....	
	Operating instructions (English, Deutsch, Français, Italiano)	ARE1177	.....	
	Operating instructions (English)	.....	ARB1279	

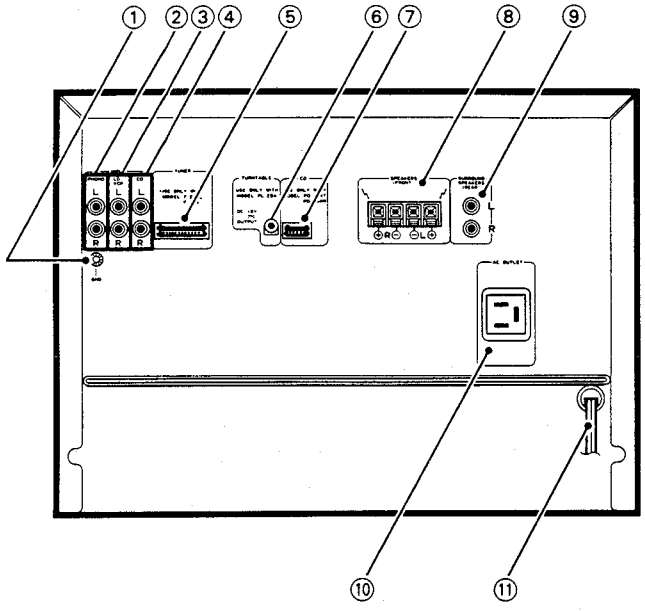
4.2 SUB TRANS assembly (AWR1059)

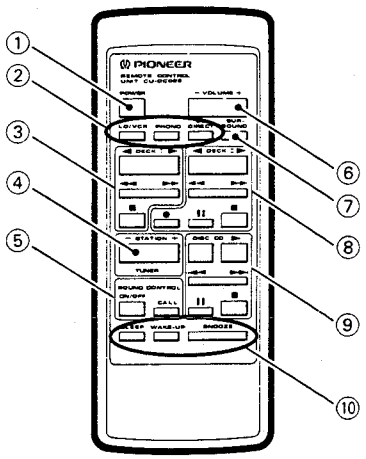
The SUB TRANS assembly (AWR1059) is the same as the SUB TRANS assembly (AWR1060) with the exception of the following sections.

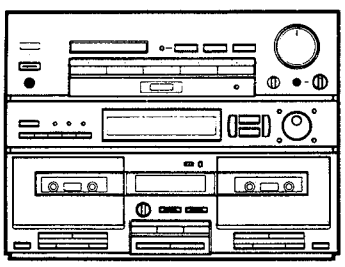
Mark	Symbol & Description	Part No.		Remarks
		AWR1060	AWR1059	
⚠	AC socket (OUTLET 1P)	AKP1034	AKP1035	*1

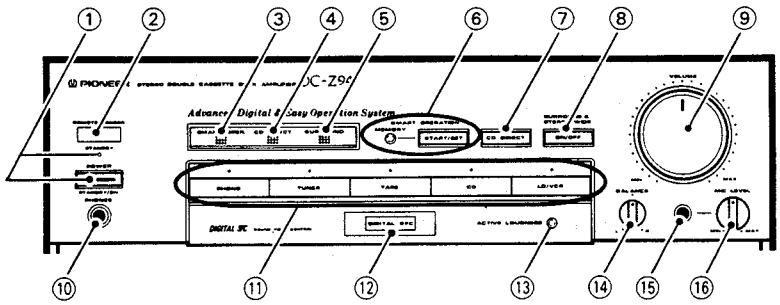
*1 : Besides, the difference parts between the SUB TRANS assemblies of the HB type (AWR1059) and the HE type (AWR1060) is the jumper wire (220V and 240V).
For detailes, refer to LINE VOLTAGE SELECTION (See page 43).

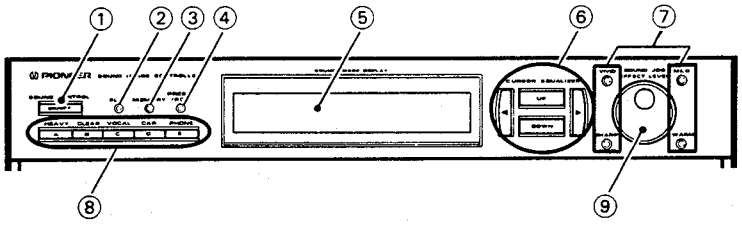
5. PANEL FACILITIES

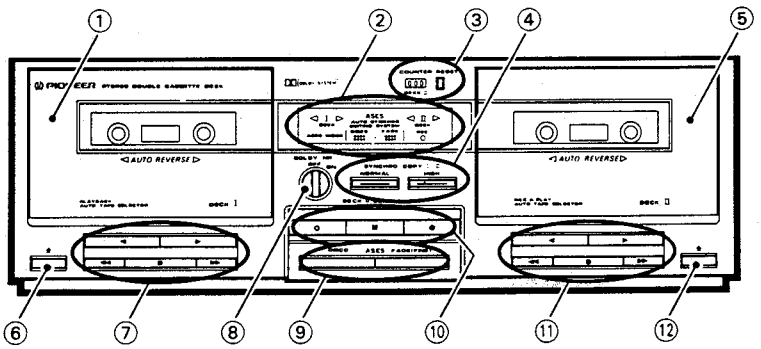












REAR PANEL FACILITIES

① Ground terminal (GND)
Connect this to the ground terminal on the turntable (except for PL-Z94).

② PHONO input jacks
Connect the audio cord of the turntable to these jacks.

③ LD/VCR jacks
Connect to audio output jacks of LD player or VCR, etc.

④ CD input jacks
Connect to output jacks of a CD player.

⑤ TUNER jacks
Connect the tuner input/output cord here.

⑥ TURNTABLE (DC 12 V OUTPUT) jack
This jack supplies power to the turntable PL-Z94.
Connect the power supply cord of the turntable to this jack.

⑦ CD jacks
Connect to a compact disc player PD-Z74T or PD-Z84M flat cable.

⑧ SPEAKERS terminals
L: Connect the left speaker system as seen from the listening position.
R: Connect the right speaker system as seen from the listening position.

NOTE:
Connect a speaker system having a nominal impedance ranging from 8 Ω to 16 Ω.

⑨ SURROUND SPEAKERS jacks
Connect the surround speaker systems.

NOTE:
Connect a speaker system having a nominal impedance of 16 Ω or more.

⑩ AC OUTLET (SWITCHED 50 W MAX)
Power supplied through this outlet is turned on and off by the cassette deck amplifier's POWER switch. Total electrical power consumption of connected equipment should not exceed 50 W.

NOTE:
Do not connect appliances with high power consumption such as heaters, irons, or television sets to the AC OUTLET in order to avoid overheating or fire hazard.
This can cause the cassette deck amplifier to malfunction.

⑪ Power cord
Connect this to the household electrical outlet.

FRONT PANEL FACILITIES

- This unit has an automatic tape type selector.
- Tapes can be played back on deck I; tapes can be played back and recorded on deck II.
- Sound can be recorded as adjusted by the sound image controller.

Amplifier section

① POWER STANDBY/ON switch /STANDBY indicator
This is the switch for electric power.
ON: When set to the ON position, power is supplied and the unit becomes operational.
STANDBY: When set to the STANDBY position, the main power flow is cut and the unit is no longer fully operational. A minute flow of power feeds the unit to maintain operation readiness.
The unit is in STANDBY when only the STANDBY indicator above the POWER switch is lit.

② REMOTE SENSOR window

③ SMART OPER. (OPERATION) indicator
This lights when smart operation is on. It goes out after about 30 seconds.

④ CD DIRECT indicator
This lights when CD DIRECT is on.

⑤ SURROUND indicator
This lights when SURROUND & STEREO WIDE is on.

⑥ SMART OPERATION buttons
[START/SET]
Use when programming memory and operating SMART OPERATION.
[MEMORY]
Use when programming SMART OPERATION into memory.

⑦ CD DIRECT button
Press this button to listen to a CD without passing the signal through sound quality adjustment circuits.

⑧ SURROUND & STEREO WIDE button
By turning this switch ON, you can enjoy surround reproduction when rear speakers are used.
By turning this switch ON, you can enjoy STEREO WIDE reproduction with greater left-right spread when rear speakers are not used.

NOTE:
- *In the case of monaural source, SURROUND & STEREO WIDE effects cannot be obtained.*
- *SURROUND & STEREO WIDE functions do not operate if CD DIRECT is on.*

⑨ VOLUME control

⑩ PHONES (Headphones) jack
For stereo headphones.

NOTE:
There is no output from the speakers when headphones are plugged into PHONES jack.

⑪ Input selector buttons

[PHONO]
Press to play records on a turntable connected to the PHONO jacks.
[TUNER]
Press to listen to radio broadcast.
[TAPE]
Press to listen to cassette tape.
[CD]
Press to listen to a CD player connected to the CD jacks.
[LD/VCR]
Press for playback on an LD player or VCR connected to the LD/VCR jacks.

⑫ DIGITAL SFC button

Use to recall a sound field mode created by SFC (Sound Field Control). When it is on, the button lights.

⑬ ACTIVE LOUDNESS button

This switches the active loudness function ON and OFF. Depending on the volume setting on the amplifier, this function automatically boosts bass and treble response.

⑭ BALANCE control

Used for changing the balance between left and right channels. Usually set this control to the center position.

⑮ MIC (Microphone) jack

This is a standard jack for connecting a microphone.

⑯ MIC LEVEL control

Used for adjusting the volume of microphone.

Sound image controller section

① SOUND CONTROL ON/OFF button

This switches the sound image controller on/off. When it's on, the SOUND CONTROL indicator in the SOUND IMAGE DISPLAY lights. During playback with CD DIRECT on, sound control is not possible.

NOTE:
Sound comes from the rear speakers regardless of whether this button is on or off.

② FLAT button

Press to reset the equalizer to flat response (no equalization).

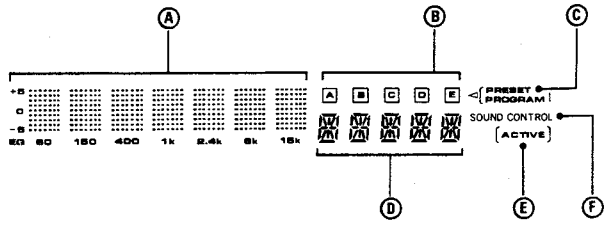
③ MEMORY button

Use this to program your desired equalization and DIGITAL SFC settings into the memory recall buttons (A to E).

④ PRESET/PGM (PROGRAM) button

Use to switch between recall of PRESET memory settings and your own original memory settings (PROGRAM) with the memory recall buttons. The memory being recalled is indicated by the lit indicator in the SOUND IMAGE DISPLAY.

⑤ SOUND IMAGE DISPLAY



Ⓐ Visual display of spectrum analyzer, graphic equalizer, and sound effect.
Ⓑ Display of the memory being recalled with the memory recall buttons.
Ⓒ This indicates the memory (PRESET and PROGRAM) that can be recalled with the memory recall buttons.
Ⓓ Letters display.
Ⓔ This lights when active loudness is on.
Ⓕ This lights when the sound control is on.

⑥ CURSOR EQUALIZER buttons

Use to adjust graphic equalizer settings.
[◄, ►]: Use these to change the frequency range to be adjusted.
[UP, DOWN]: Use these to adjust the degree of equalization.

⑦ Image effect buttons

These buttons let you select the effect mode most suitable for a particular genre of music. Adjust the effect level with the SOUND JOG.

⑧ Memory recall buttons

Use to recall preset equalization settings. Also use to program into memory and recall desired sound settings.

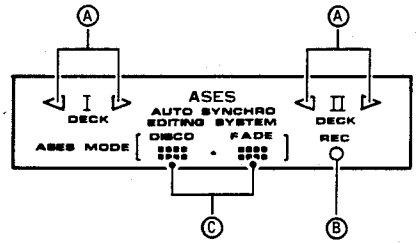
⑨ SOUND JOG

Use to adjust image effect level and DIGITAL SFC effect level.
The image effect or DIGITAL SFC currently shown in the SOUND IMAGE DISPLAY can be adjusted.

Cassette Deck Section

① Deck I cassette door

② Operation indicators



Ⓐ **Direction (◁, ▷):** Indicates direction of tape travel during recording or playback. Flashes slowly in Pause mode. Flashes rapidly during Music Search (MS).
Ⓑ **REC:** Lights when recording. It flashes during tape copying.
Ⓒ **ASES MODE**
FADE: Fade edit in progress.
DISCO: Disco edit in progress.

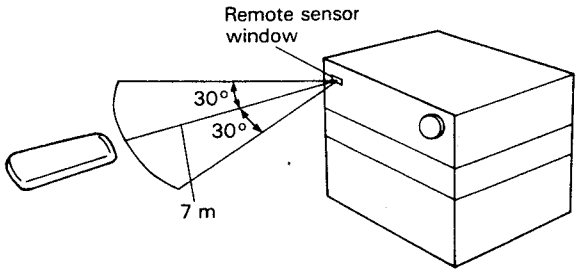
⑩ Timer operation buttons

SLEEP: Sets the sleep timer.
WAKE-UP: Timer playback setting/cancellation can be performed when the timer playback time has been set. This is shown in the tuner display section.
SNOOZE: Turns off power if pressed after timer playback begins. Timer playback begins again approx. 5 minutes later.

The amplifier input selector automatically switches to the music source being operated when you press the CD playback (►), cassette deck playback (◄, ►), or tuner station controls.

NOTE:
It is not possible to operate the CD player with the remote control unless the control cord is connected.

Range of remote control



When the remote control unit is pointed at the remote sensor window on the amplifier section and any of its buttons is pressed, the tuner and other components can be operated by remote control.
Distance: Within a range of approx. 7 meters (23 feet) from the remote sensor window.
Angle: Within approx. 30 degrees from the center of the remote sensor window.
Remote control will not be possible if there is an obstacle between the remote control unit itself and the remote sensor window.
Performance of the remote control unit is adversely affected in the presence of strong fluorescent light. Keep such lights away, especially from the sensor window.

6. SPECIFICATIONS

Amplifier Section

Music power (DIN) ..... 90 W + 90 W (1 kHz, T.H.D. 1 %, 8 Ω)
Continuous Power Output (DIN) ..... 55 W + 55 W (1 kHz, T.H.D. 1 %, 8 Ω)
Graphic equalizer frequency band..... 60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz, 15 kHz, ±5.5 dB
Total Harmonic Distortion
(40 Hz to 20,000 Hz, 27.5 W, 8 Ω)**..... No more than 0.2 %

Cassette Deck Section

Systems..... 4 track, 2-channel stereo
Heads..... Recording/playback head x 1
Playback head x 1
Erasing head x 2
Motor..... DC servo 2 speed motor x 2
Wow and Flutter..... No more than 0.09 % (WRMS)
Fast Winding Time ..... Approximately 105 seconds (C-60 tape)
Frequency Response (– 20 dB recording):
Normal tape ..... 35 Hz to 14,000 Hz ±6 dB
CrO_2 tape ..... 35 Hz to 15,000 Hz ±6 dB
Signal-to-Noise ratio
Dolby NR OFF..... 56 dB
Noise Reduction Effect
Dolby B type NR ON ..... More than 10 dB (at 5 kHz)

Furnished Parts
Operating Instructions 1
Remote Control Unit 1
Dry Cell Batteries..... 2

Miscellaneous

Power requirements ..... a.c. 220 Volts, 50/60 Hz
Power Consumption ..... 370 W
Dimensions ..... 360 (W) x 271 (H) x 309 (D) mm
Weight (without package) ..... 9 kg

Accessories

EP Adapter..... 1

- *Specifications and design subject to possible modification without notice due to improvement.*

** *Measured By Audio Spectrum Analyzer.*

③ DECK II COUNTER and RESET button
Press the RESET button to reset the tape counter display to 000.

④ SYNCHRO COPY I ▷ II buttons
Used for tape copying.
NORMAL: Copying from the Deck I tape to the Deck II tape at normal recording/playback speed.
HIGH: Copying at about twice normal tape speed. (Copies can be made in about half the NORMAL time.)

⑤ Deck II cassette door

⑥ Deck I EJECT button

⑦ Deck I operation buttons
► **(PLAY: FWD)** .. For playing back a tape in the forward mode.
◄ **(PLAY: REV)** ... For playing back a tape in the reverse mode.
■ **(STOP)** ..... For stopping the tape.
►► **(FAST)** ..... Fast forward in forward mode, rewind in reverse mode.
Music search (MS) starts if this is pressed during playback.
◄◄ **(FAST)** ..... Rewind in forward mode, fast forward in reverse mode.
Music search (MS) starts if this is pressed during playback.

⑧ DOLBY* NR switch
Set this switch to the ON position to activate the DOLBY NR system.
- Tapes recorded using Dolby noise reduction should always be played back with the noise reduction system on. Sound quality will be adversely affected if played back with the system off, or if tapes recorded using a different noise reduction system are played back with the Dolby NR system on.
- It is recommended that tapes recorded with Dolby B type NR be so marked on the label. This will help prevent incorrect setting of the noise reduction switch during playback.

*
Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol ⊡⊡ are trademarks of Dolby Laboratories Licensing Corporation.

⑨ A.S.E.S. buttons
Used for automatically recording a CD on cassette tape.
FADE (FINE): The sound fades out at the end of the tape.
DISCO: This cross-fades between songs during recording.

NOTE:
- *FINE is the mode when performing CD player COMPU PGM EDIT (Computer Allocated Program Editing).*
- *The FADE (FINE) modes provide a blank space of about five seconds between songs.*

⑩ DECK II CONTROL buttons
● **(REC)**..... To set to recording standby mode. The REC indicator lights and the direction indicators (◄ and ►) flash. Recording begins when you press the PLAY button (◄ or ►).
❚❚ **(PAUSE)**..... Temporarily stops tape travel. Cancels pause mode when pressed again or press the PLAY button.
○ **(MUTE)**..... Used for creating a blank space between songs.

⑪ Deck II operation buttons
Same as Deck I operation buttons ⑦.

⑫ Deck II EJECT button

Remote control unit

① POWER button

② Function buttons
LD/VCR ..... Sets function to LD/VCR.
PHONO..... Sets function to PHONO.
CD DIRECT ..... Sets function to CD DIRECT.

③ DECK I operation buttons: Same as Deck I operation buttons on the cassette deck amplifier.

④ TUNER STATION button
- Before operation, memorize broadcast stations in the STATION CALL buttons.

\+ ..... Stations change in order in the upward direction
– ..... Stations change in order in the downward direction.

⑤ SOUND CONTROL operation buttons
ON/OFF: Turns the sound image controller on and off.
CALL: Recalls the preset equalizing curves (PRESET) and memorized sound control (PROGRAM) in sequence.

⑥ VOLUME + (UP)/– (DOWN) button
When pressed, VOLUME on the amplifier is actually moved by a motor.

⑦ SURROUND button
Turns SURROUND & STEREO WIDE on and off.

⑧ Deck II operation button: Same as Deck II operation buttons and DECK II CONTROL buttons on the cassette deck amplifier (except MUTE).

⑨ CD operation buttons
Perform the connections so that the CD player is operated by the remote control unit.
► ..... Play
DISC..... DISC selection
■ ..... Stop
❚❚ ..... Pause
|◄◄ , ►►| ..... Track search

NOTE:
Note that the DISC selector button on the remote control unit may not operate, depending on the CD player used.

PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
ARP2140

ADJUSTMENTS FOR

XD-Z54T
XD-Z84T
DC-Z94
DC-Z84
DC-Z74

- **This service manual is a compilation of the adjustments in the preceding manual.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

CONTENTS

1. DECK AMP BLOCK 2
1. BLOC AMPLI PLATINE 6
1. BLOQUE DE AMPLIFICADOR DECK 10
2. CD BLOCK 14
2. BLOC CD 28
2. BLOQUE CD 42

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

© PIONEER ELECTRONIC CORPORATION 1990

YV DEC. 1990 Printed in Japan

1. DECK AMP BLOCK

Adjustment of Mechanical section

- Test tape : STD-301 (3 kHz 30 min)
- Setting of double speed mode : Short-circuit TP1601 and TP1602 of the DISPLAY assembly. To release the mode, disconnect the short circuit.

1. Adjustment of tape speed

No.	Mode	Input signal & Test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1	PLAY	Playback the STD-301 tape to 3 kHz.	Deck I	DISPLAY assembly VR1601	AF assembly JP-L (Lch)	Press the PLAY button and adjust the frequency to 3010 Hz ±10 Hz. Make sure that the wow and flutter is within 0.2 %.	
2	PLAY (Double speed mode)			—		Press the PLAY button in double speed mode and confirm that the frequency is 6000 Hz ±1000 Hz. Note down the figure.	Release the double speed mode after adjustment.
3	PLAY (Double speed mode)		Deck II	DISPLAY assembly VR1603	AF assembly JP-R (Rch)	Press the PLAY button in double speed mode and adjust the frequency to be within ±30 Hz of the figure recorded at step No. 2.	Release the double speed mode after adjustment.
4	PLAY			DISPLAY assembly VR1602		Press the PLAY button and adjust the frequency to 3010 Hz ±10 Hz. Make sure that the wow and flutter is within 0.2 %.	

Adjustment of Electric section

■ Check and conduct the following before adjusting the electric section.

1. Adjustment of tape speed has been completed.
2. Clean and demagnetize the head using a head eraser.
3. When measured, the level should be 0 dBV = 1 Vrms.
4. Use side A of the specified tape for adjustment.
   STD-331B: For adjustment of playback system.
   STD-630: NORMAL blank tape
5. Prepare the following measuring devices:
   AC millivoltmeter, Low-frequency oscillator, Attenuator, Oscilloscope
6. Adjust both L and R channels, unless specified otherwise.
7. Set the DOLBY NR switches to OFF, unless specified otherwise.
8. Warm up the unit for several minutes before adjustment. Especially before adjusting the frequency characteristics of recording and playback, warm up for 3 to 5 minutes in REC/PLAY mode.
9. Make sure to follow the proper order of the adjustment procedure. Any change in the order may cause an improper result.
10. The AF assembly contains JP-L and JP-R.(See Fig.1–4)

List of Adjustment

Deck I

1. Head azimuth adjustment
2. Playback level adjustment

Deck II

1. Head azimuth adjustment
2. Playback level adjustment
3. Bias oscillation frequency adjustment
4. Recording level adjustment
5. Adjustment of frequency characteristics of recording / playback

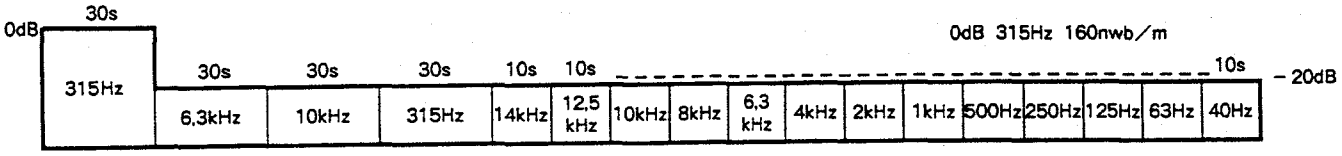


Fig. 1－1 Test tape STD-331B

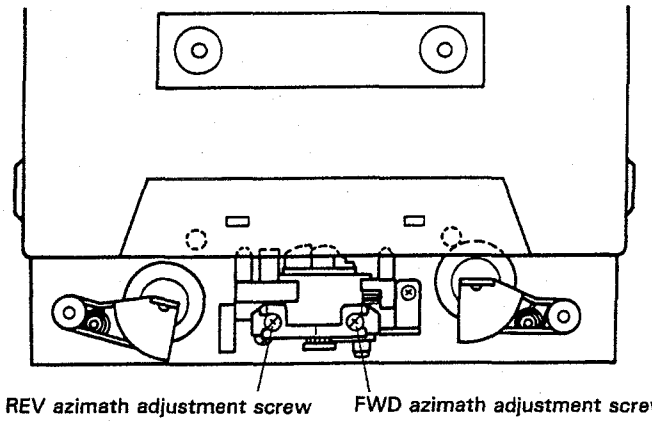


Fig. 1－2 Head azimath adjustment

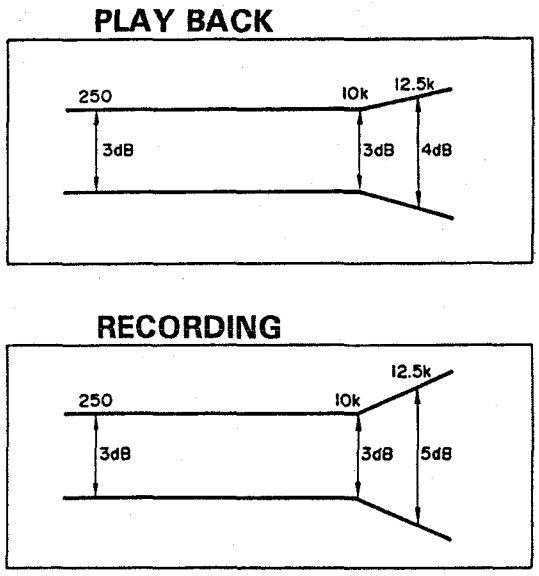


Fig. 1－3 Frequency characteristics

• Head Adjustment of Deck I

- Deck I is provided with an automatic tape selector mechanism.
- Note: Do not switch over FWD and REV while the screw driver is inserted.

1. Head Azimuth Adjustment

Procedure	Tape selector	Mode	Input signal/test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	NORM	PLAY	Playback the test tape STD-331B (10 kHz, －20 dB).	Head azimuth adjustment screw (Fig. 1-2)	JP-L (Lch) JP-R (Rch)	Maximum playback signal level	Lock the screw with screw lock after completing adjustment.

2. Playback Level Adjustment

- Be sure to make a careful adjustment, as the adjustment determines the DOLBY NR level for playback.

Procedure	Tape selector	Mode	Input signal/test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	NORM	PLAY	Playback the test tape STD-331B (315 Hz, 0 dB).	1 Mecha assembly VR2001 (Lch) VR2002 (Rch)	JP-L (Lch) JP-R (Rch)	－5.2 dBv	

• Head Adjustment of Deck II

- Deck II is provided with an automatic tape selector mechanism.
- Note: Do not switch over FWD and REV while the screw driver is inserted.
- DC−Z94/SD and YPW types : in the following table of adjustment values *1 becomes −10.3dBv and *2 becomes −30.3dBv.

1. Head Azimuth Adjustment

Procedure	Tape selector	Mode	Input signal/test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	NORM	PLAY	Playback the test tape STD-331B (10 kHz, −20 dB).	Head azimuth adjustment screw (Fig. 1-2)	JP-L (Lch) JP-R (Rch)	Maximum playback signal level	Lock the screw with screw lock after completing adjustment.

2. Playback Level Adjustment

- Be sure to make a careful adjustment, as the adjustment determines the DOLBY NR level for playback.

Procedure	Tape selector	Mode	Input signal/test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	NORM	PLAY	Playback the test tape STD-331B (315 Hz, 0 dB).	2 Mecha assembly VR2021 (Lch) VR2022 (Rch)	JP-L (Lch) JP-R (Rch)	−5.2 dBv *1	

3. Bias oscillation frequency adjustment

Procedure	Tape selector	Mode	Input signal/test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	NORM	REC	Load the test tape STD-630 and set to record mode.	2 Mecha assembly T2251	Area between Ⓐ and Ⓑ (2 Mecha assembly) shown in Fig.1-6.	The oscillation frequency is 105 kHz ±5 kHz.	

4. Recording Level Adjustment

Procedure	Tape selector	Mode	Input signal/test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	NORM	REC	Apply a signal of 315 Hz to the LD/VCR input terminal and set the function to "LD/VCR".	Input signal level	JP-L (Lch) JP-R (Rch)	−5.2 dBv *1	
2	NORM	REC / PLAY	Record and playback the test tape STD-630 (315 Hz).	AF assembly VR2201 (Lch) VR2202 (Rch)	JP-L (Lch) JP-R (Rch)	Repeat the recording/playback, and make adjustment so that the playback level of 315 Hz is −5.2 dBv.	

5. Adjustment of frequency characteristics of recording/playback

- As this procedure is for adjustment of the recording bias, be careful not to increase the distortion by under-adjusting the bias.

Procedure	Tape selector	Mode	Input signal/test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1	NORM	REC	Apply a signal of 315 Hz to the LD/VCR input terminal and set the function to "LD/VCR".	Input signal level	JP-L (Lch) JP-R (Rch)	−25.2 dBv *2	
2	NORM	REC / PLAY	Record and playback the test tape STD-630 (315 Hz and 10 kHz).	2 Mecha assembly VR2251 (Lch) VR2252 (Rch)	JP-L (Lch) JP-R (Rch)	Repeat the recording/playback, and make adjustment so that the playback level of 10 kHz remains 0 ±0.5 dB in relation to 315 Hz.	

• Adjustment location

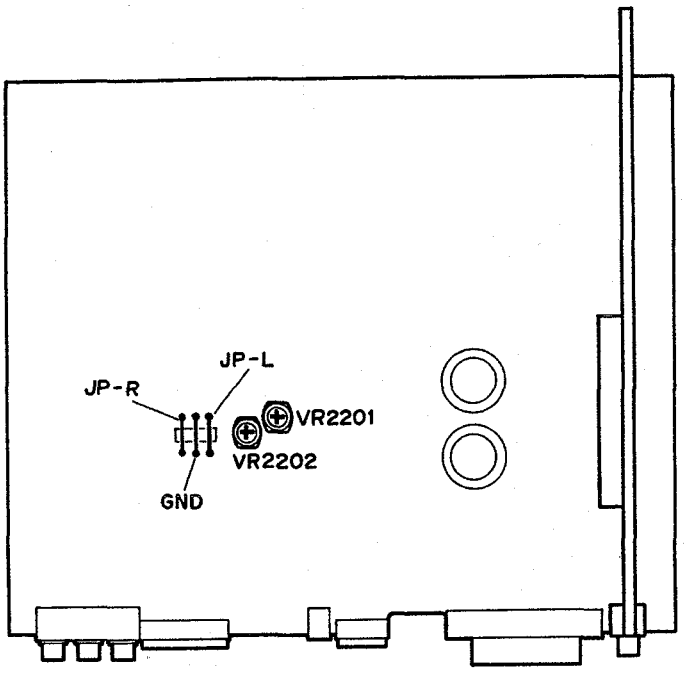
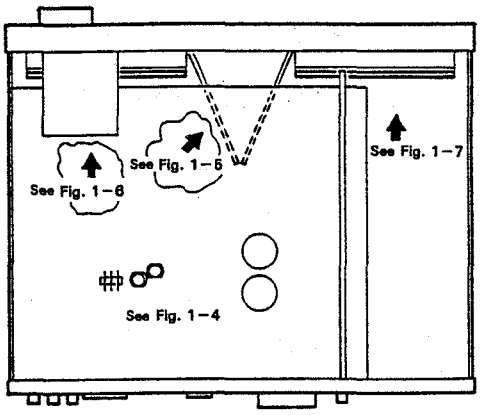
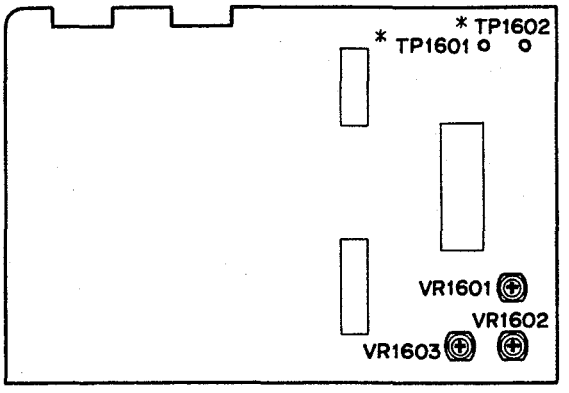


Fig. 1－4 AF assembly





* : TP1601 and TP1602 are not indicated on the P.C.Board.

Fig. 1－5 DISPLAY assembly

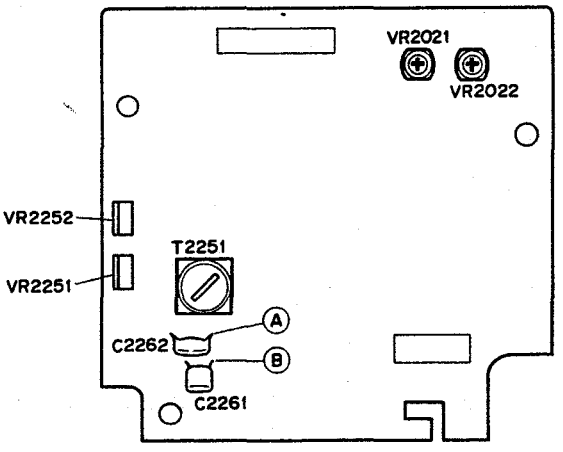


Fig. 1－6 2 Mecha assembly

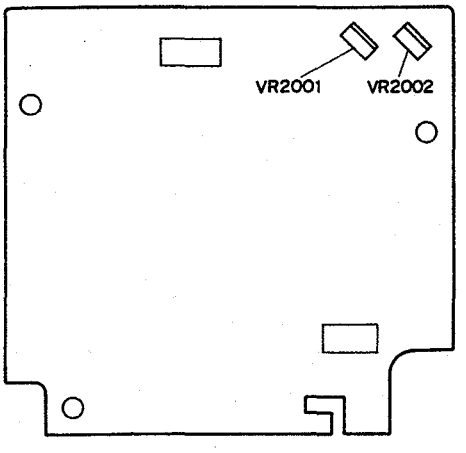


Fig. 1－7 1 Mecha assembly

1. BLOC AMPLI PLATINE

Réglages des parties mécaniques

- Bande d'étalonnage: STD-301 (3 kHz, 30 mn.)
- Réglage du mode de vitesse double : Court-circuiter TP1601 et TP1602 de l'ensemble AFFICHAGE. Pour libérer le mode, déconnecter le court-circuit.

1. Réglage de la vitesse de bande

No.	Mode	Signal appiligeé /bande d'étalonnage	Emplacement du réglage		Emplacement du point de mesure	Valeur relevée	Dbservations
1	PLAY	Reproduire la bande STD-301 par 3 kHz.	Platine I	Ensemble AFFICHAGE VR1601	Ensemble AF JP-L (can. G)	Appuyer sur la touche PLAY et régler la fréquence sur 3010 Hz ±10 Hz. Vérifier que le pleurage et scintillement est dans la limite de 0,2%.	
2	PLAY (Mode de vitesse double)			—		Appuyer sur la touche PLAY dans le mode de vitesse double et vérifier que la fréquence est 6000 Hz ±1.000 Hz. Noter le chiffre.	Libérer le mode de vitesse double après le réglage.
3	PLAY (Mode de vitesse double)		Platine II	Ensemble AFFICHAGE VR1603	Ensemble AF JP-R (can. D)	Appuyer sur la touche PLAY dans le mode de vitesse double et régler la fréquence pour qu'elle soit dans la limite de ±30 Hz du chiffre noté dans l'étape No. 2.	Libérer le mode de vitesse double après le réglage.
4	PLAY			Ensenble AFFICHAGE VR1602		Appuyer sur la touche PLAY et régler la fréquence sur 3010 Hz ±10 Hz. Vérifier que le pleurage et scintillement est dans la limite de 0,2%.	

Réglages des parties électriques

■ Vérifier les points suivants et effectuer les opérations suivantes avant procéder aux réglages des parties électriques.

1. Le réglage de la vitesse de bande a été complété.
2. Nettoyer et démagnétiser la tête avec un démagnétiseur de tête.
3. Lors de la mesure, le niveau doit être de 0 dBV = 1 Vepp.
4. Utiliser la face A de la bande spécifiée pour le réglage. STD-331B: Pour le réglage du système de lecture.
   STD-630: Bande vierge NORMAL
5. Préparer les instruments de mesure suivants:
   Millivoltmètre CA, oscillateur à basse fréquence, éatténnateur et oscilloscope.
6. Régler les deux canaux L (gauche) et R (droit), sauf spécification contraire.
7. Régler les commutateurs DOLBY NR sur la position OFF, sauf spécification contraire.
8. Laisser chauffer l'appareil pendant plusieurs minutes avant le réglage. En particulier avant d'effectuer le réglage de la réponse en fréquence d'enregistrement et de lecture, laisser chauffer l'appareil pendant 3 à 5 minutes dans le mode d'enregistrement/lecture (REC/PLAY).
9. Toujours suivre l'ordre spécifié de la méthode de réglage. Tout changement de l'ordre peut provoquer des résultats incorrects.
10. L'ensemble AF comprend JP-L et JP-R.(Voir Fig. 1–4)

Liste des réglages

Platine I

1. Azimut de la tête
2. Niveau de lecture

Platine II

1. Azimut de la tête
2. Niveau de lecture
3. Réglage de fréquence d'oscillation de polarisation
4. Niveau d'enregistrement
5. Réponse en fréquence d'enregistrement / lecture

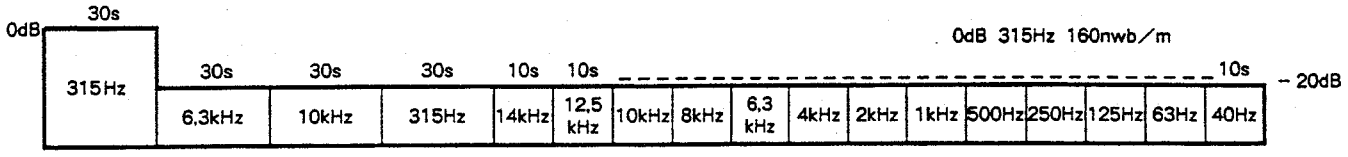


Fig. 1－1 Bande d'étalommge STD-331B

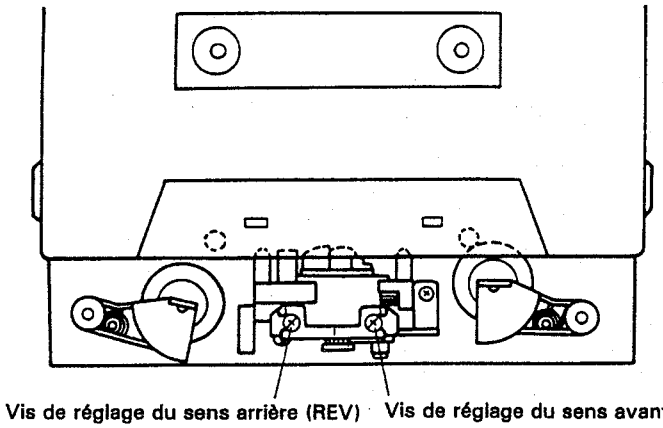


Fig. 1－2 Réglage d'azimut de la tête

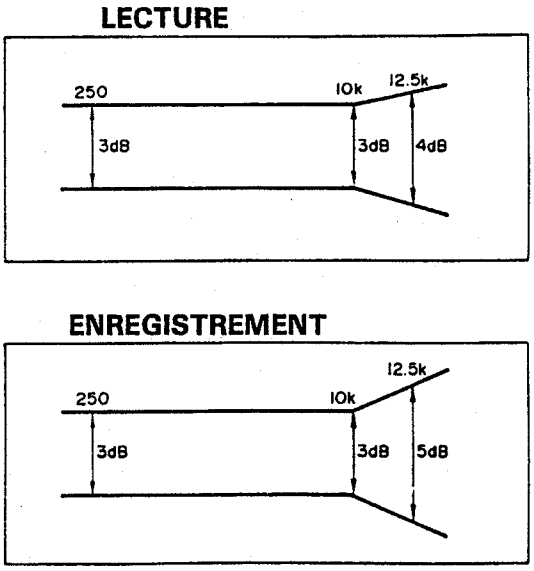


Fig. 1－3 Réponse en fréquence

• Réglage de la Platine I

- La Platine I est équipée d'un mécanisme de sélection automatique de bande.
- Remarque: Ne pas commuter entre le sens avant (FWD) et le sens arrière (REV) pendant que le tournevis est inséré.

1. Réglage d'azimut de la tête

Opération	Sélecteur de bande	Mode	Signal appiligeé / bande d'étalonnage	Emplacement du réglage	Emplacement du point de mesure	Valeur mesurée	Obserrations
1	NORM	PLAY	Reproduire la bande d'étalonnage STD-331B (10 kHz, －20 dB).	Vis de réglage d'ézimut de tête (Fig. 1-2)	JP-L (can. G) JP-R (can. D)	Niveau maximum du signal de lecture	Une fois le réglage terminé, bloquer la vis avec un frein de vis.

2. Réglage du niveau de lecture

- Toujours effectuer un réglage minutieux, car la valeur réglée sera le niveau Dolby pour la lecture.

Opération	Sélecteur de bande	Mode	Signal appiligeé / bande d'étalonnage	Emplacement du réglage	Emplacement du point de mesure	Valeur mesurée	Obserrations
1	NORM	PLAY	Reproduire la bande d'éealonnfe STD-331B (315 kHz, 0 dB)	Ensemble MECA 1 VR2001 (can. G) VR2002 (can. D)	JP-L (can. G) JP-R (can. D)	－5.2 dBv	

• Réglage de la Platine II

- La Platine II est équipée d'un mécanisme de sélection automatique de bande.
- Remarque : Ne pas commuter entre le sens avant (FWD) et le sens arrière (REV) pendant que le tournevis est inséré.
- Types DC－Z94/SD et YPW : dans le tableau suivant les valeurs de réglage *1 et *2 sont respectivement égales à －10,3 dBv et －30,3 dBv.

1. Réglage d'azimut de la tête

Opération	Sélecteur de bande	Mode	Signal appliqué / bande d'étalonnage	Emplacement du réglage	Emplacement du point de mesure	Valeur mesurée	Observations
1	NORM	PLAY	Reproduire la bande d'étalonnage STD-331B (10 kHz, －20 dB).	Vis de réglage d'ézimut de tête (Fig. 1-2)	JP-L (can. G) JP-R (can. D)	Niveau maximum du signal de lecture	Une fois le réglage terminé, bloquer la vis avec un frein de vis.

2. Réglage du niveau de lecture

- Toujours effectuer un réglage minutieux, car la valeur réglée sera le niveau Dolby pour la lecture.

Opération	Sélecteur de bande	Mode	Signal appliqué / bande d'étalonnage	Emplacement du réglage	Emplacement du point de mesure	Valeur mesurée	Observations
1	NORM	PLAY	Reproduire la bande d'éealonnfe STD-331B (315 kHz, 0 dB)	Ensemble MECA 2 VR2021 (can. G) VR2022 (can. D)	JP-L (can. G) JP-R (can. D)	－5.2 dBv *1	

3. Réglage de fréquence d'oscillation de polarisation

Opération	Sélecteur de bande	Mode	Signal appliqué / bande d'étalonnage	Emplacement du réglage	Emplacement du point de mesure	Valeur mesurée	Observations
1	NORM	REC	Charger la bande d'éealonnage STD-630 et régler dans le mode d'enregistrement.	Ensemble MECA 2 T2251	Zone entre Ⓐ et Ⓑ (ensemble MECA 2) montrée à la Fig. 1-6.	La fréquence d'oscillation est de 105 kHz ±5 kHz.	

4. Réglage du niveau d'enregistrement

Opération	Sélecteur de bande	Mode	Signal appliqué / bande d'étalonnage	Emplacement du réglage	Emplacement du point de mesure	Valeur mesurée	Observations
1	NORM	REC	Appliquer un signal de 315 Hz à la borne d'entrée LD/VCR et régler la fonction sur "LD/VCR".	Niveau du signal d'entrée	JP-L (can. G) JP-R (can. D)	－5.2 dBv *1	
2	NORM	REC / PLAY	Enregistrer et reproduire la bande d'étalonnageSTD-630 (315 Hz).	Ensemble AF VR2201 (can. G) VR2202 (can. D)	JP-L (can. G) JP-R (can. D)	Répéter l'enregistrement/lecture et faire l'ajustment de sorte que le niveau de lecture de 315 Hz soit de －5,2 dBv.	

5. Réglage de la réponsen fréquence d'enregistrement/lecture

- Cette opération réglant la polarisation d'enregistrement, faire attention de ne pas augmenter la distorsion par un réglage insuffisant de la polarisation.

Opération	Sélecteur de bande	Mode	Signal appliqué / bande d'étalonnage	Emplacement du réglage	Emplacement du point de mesure	Valeur mesurée	Observations
1	NORM	REC	Appliquer un signal de 315 Hz à la borne d'entrée LD/VCR et régler la fonction sur "VD/VCR".	Niveau du signal d'entrée	JP-L (can. G) JP-R (can. D)	－25.2 dBv *2	
2	NORM	REC / PLAY	Enregistrer et reproduire la bande d'étalonnage STD-630 (315 Hz et 10 kHz).	Ensemble MECA 2 VR2251 (can. G) VR2252 (can. D)	JP-L (can. G) JP-R (can. D)	Répéter l'enregistrement/lecture et faire l'ajustment de sorte que le niveau de lecture de 10 kHz soit de 0 ±0,5 dB en relation avec 315 Hz.	

• Points de réglage

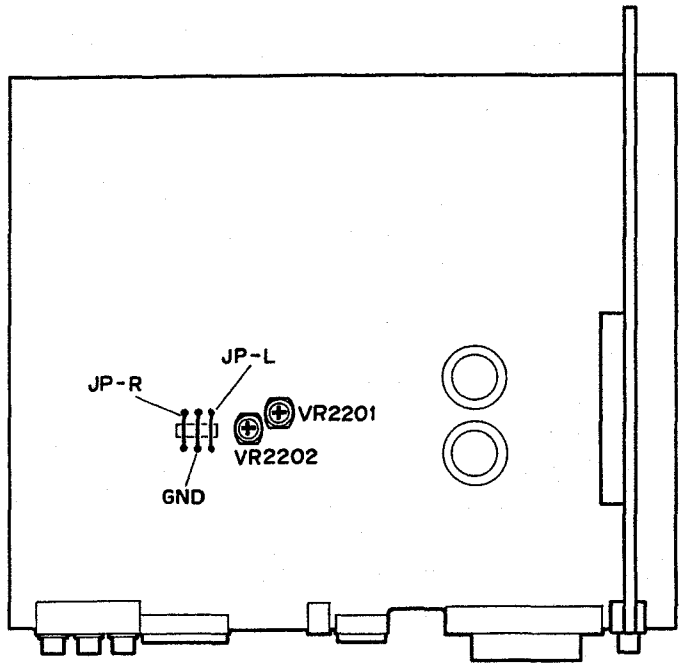
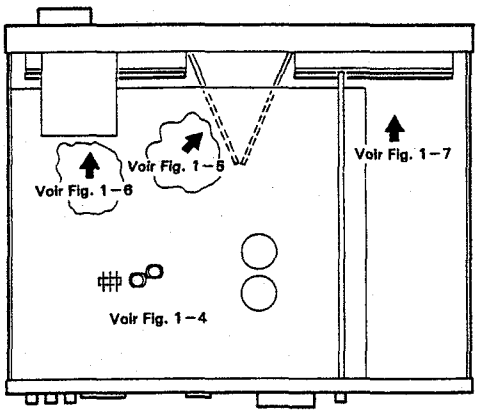
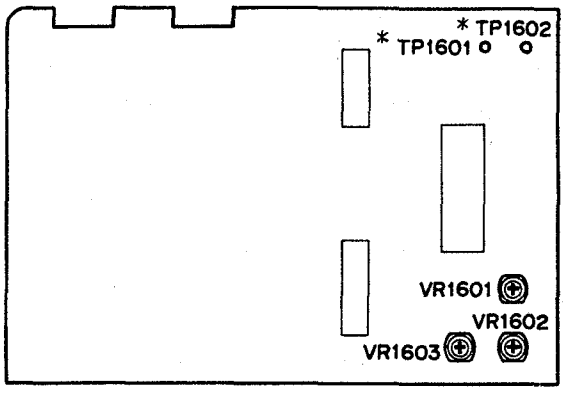


Fig. 1 – 4 Ensemble AF





* : TP1601 et TP1602 ne sont pas indiqués sur la carte.

Fig. 1 – 5 Ensemble AFFICHAGE

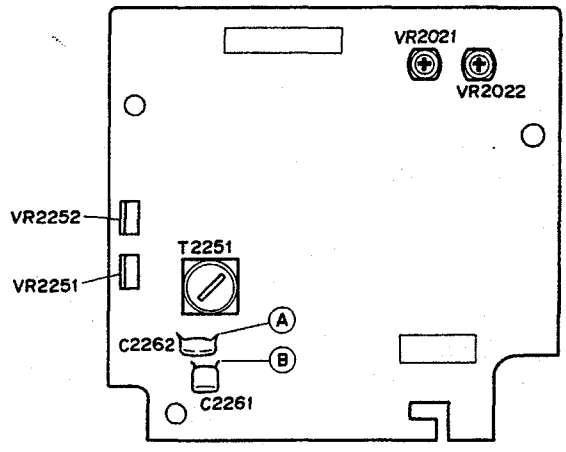


Fig. 1 – 6 Ensemble MECA 2

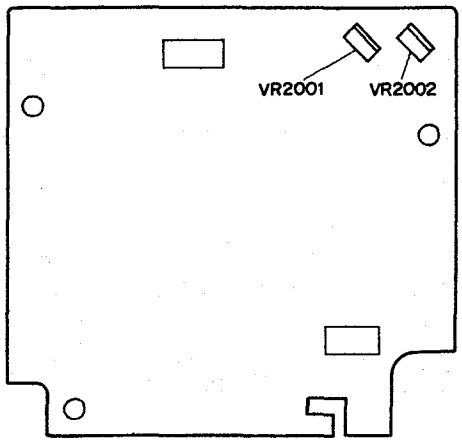


Fig. 1 – 7 Ensemble MECA 1

1. BLOQUE DE AMPLIFICADOR DECK

Ajuste de la sección mecánica

- Cinta de prueba: STD-301 (3 kHz, 30 min)
- Ajuste del modo de velocidad doble: Cortocircuite TP1601 y TP1602 del conjunto del visualizador (DISPLAY). Para desactivar el modo, desconecte el cortocircuito.

1. Ajuste de la velocidad de la cinta

Nº	Modo	Señal de enerada/ cinea de prueba	Punto de ajuste		Punto de medición	Valor de ajuste	Observaciones
1	PLAY	Reproducci' on de la cinta STDy301 a 3 kHz	Sección I	VR1601 del conjunto DISPLAY	JP-L del conjunto AF (canal izquierdo)	Presione el botón PLAY y ajuste la frecuencia a 3010 Hz ±10 Hz. Cerciórese de que la fluctuación y el efecto de trémolo estén dentro de los límites del 0,2%.	
2	PLAY (Modo de velocidad doble)			—		Presione el botón PLAY en el modo de velocidad doble y compruebe si la frecuencia es 6000 Hz ±1000 Hz. Anote el valor.	Después del ajuste, desactive el modo de velocidad doble.
3	PLAY (Modo de velocidad doble)		Sección II	VR1603 del conjunto DISPLAY	JP-R del conjunto AF (canal derecho)	Presione el botón PLAY en el modo de velocidad doble y ajuste la frecuencia de forma que quede a ±30 Hz del valor anotado en el paso N°2.	Después del ajuste, desactive el modo de velocidad doble.
4	PLAY			VR1602 del conjunto DISPLAY		Presione el botón PLAY y ajuste la frecuencia a 3010 Hz ±10 Hz. Cerciórese de que la fluctuación y el efecto de trémolo estén dentro de los límites del 0,2%.	

Ajuste de la sección eléctrica

■Antes de ajustar el sección eléctrica, compruebe y realice lo siguiente.

1. El ajuste de la velocidad de la cinta ha finalizado.
2. Limpie y desmagnetice la cabeza empleando un desmagnetizador de cabezas.
3. Cuando se mida, el nivel devel debe ser de 0 dBV = 1V rms.
4. Emplee el lado A de la cinta especificada para realizar el ajuste.
   STD-331B: Para ajuste del sistema de reproducción.
   STD-630: Cinta en blanco NORMAL
5. Prepare los dispositivos de medición siguientes: Milivoltímetro de CA, oscilador de baja frecuencia, atenuador, y osciloscopio
6. Ajuste ambos canales, izquierdo y derecho, a menos que se especifique otra cosa.
7. Ponga los interruptores DOLBY NR en OFF, a menos que se especifique otra cosa.
8. Antes del ajuste, deje que la unidad se caliente durante varios minutos.
   Especialmente antes de ajustar las características de frecuencia de grabación y reproducción, deje que se caliente durante 3 a 5 minutos en el modo REC/PLAY.
9. Cerciórese de seguir el orden apropiado del procedimiento de ajuste. Cualquier cambio en el orden podría causar un resultado inadecuado.
10. El conjunto AF contiene JP-L y JP-R.(Vea la Fig. 1–4)

Lista de adjuste

Sección I

1. Azimut de la cabeza
2. Nivel de reproducción

Sección II

1. Azimut de la cabeza
2. Nivel de reproducción
3. Ajuste de la frecuencia de oscilación de polarización
4. Nivel de grabación
5. Características de frecuencia de grabación/reproducción

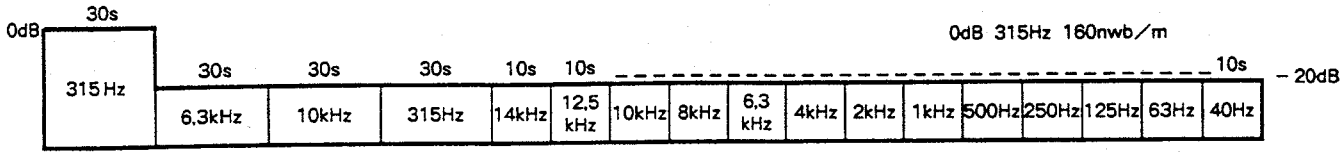


Fig. 1 – 1 Cinta de prueba STD-331B

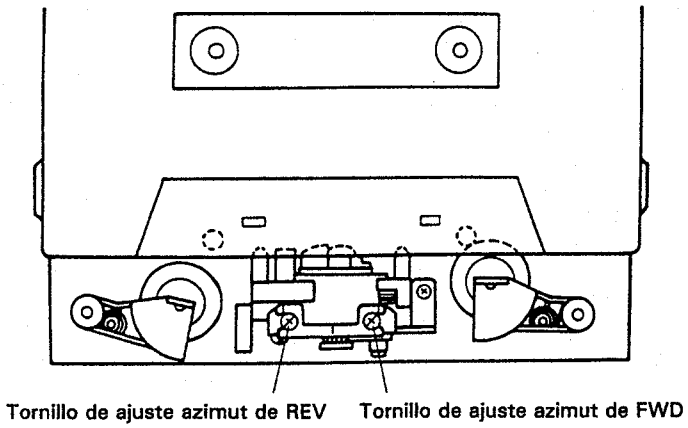


Fig. 1 – 2 Ajuste del azimut de la cabeza

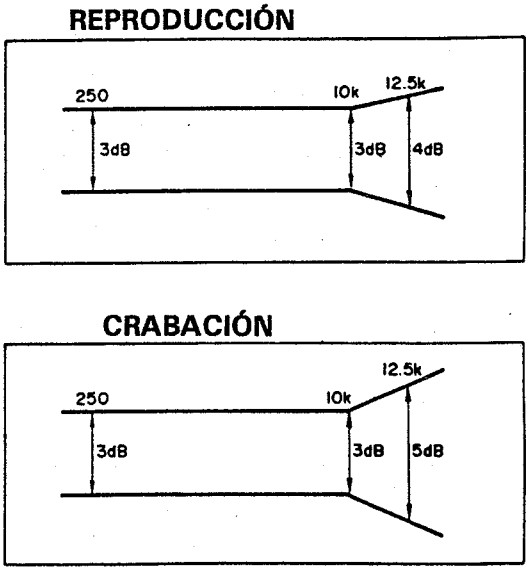


Fig. 1 – 3 Características de frecuencia

• Ajuste de la sección I

- La sección I dispone de un mecanismo selector automático de cinta.
- Nota : No cambie a FWD ni a REV mientras el destornillador esté insertado.

1. Ajuste azimutal de la cabeza

Procedimiento	Selector de cinta	Modo	Señal de entrada / cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	NORM	PLAY	Ponga la cinta de prueba STD-331B en reproducción (10 kHz, –20 dB).	Tornillo de ajuste azimutal de la cabeza (Fig. 1-2)	JP-L (canal izquierdo) JP-R (canal derecho)	Nivel máximo de la señal de reproducción	Bloquee el tornillo con bloqueador de tornillos después de haber terminado el ajuste.

2. Ajuste del nivel de reproducción

- Tenga mucho cuidado durante el ajuste, ya que el valor ajustado será el nivel Dolby fijado para reproducción.

Procedimiento	Selector de cinta	Modo	Señal de entrada / cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	NORM	PLAY	Ponga la cinta de prueba STD-331B en reproducción (315 Hz, 0 dB).	Conjunto mecánico 1 VR2001 (canal izquierdo) VR2002 (canal derecho)	JP-L (canal izquierdo) JP-R (canal derecho)	–5.2 dBv	

• Ajuste de la sección II

- La sección II dispone de un mecanismo selector automático de cinta.
- Nota : No cambie a FWD ni a REV mientras el destornillador esté insertado.
- Tipos DC−Z94/SD y YPW : En la tabla siguiente de valores de ajuste, *1 pasa a ser −10,3 dBv y *2 pasa a ser −30,3 dBv.

1. Ajuste azimutal de la cabeza

Procedimiento	Selector de cinta	Modo	Señal de entrada / cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	NORM	PLAY	Ponga la cinta de prueba STD-331B en reproducción (10 kHz, −20 dB).	Tornillo de ajuste azimutal de la cabeza (Fig. 1-2)	JP-L (canal izquierdo) JP-R (canal derecho)	Nivel máximo de la señal de reproducción	Bloguee el tornillo con bloqueador de tornillos después de haber terminado el ajuste.

2. Ajuste del nivel de reproducción

- Tenga mucho cuidado durante el ajuste, ya que el valor ajustado será el nivel Dolby fijado para reproducción.

Procedimiento	Selector de cinta	Modo	Señal de entrada / cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	NORM	PLAY	Ponga la cinta de prueba STD-331B en reproducción (315 Hz, 0 dB).	Conjunto mecánico 2 VR2021 (canal izquierdo) VR2022 (canal derecho)	JP-L (canal izquierdo) JP-R (canal derecho)	−5.2 dBv *1	

3. Ajuste de la frecuencia de oscilación de polarización

Procedimiento	Selector de cinta	Modo	Señal de entrada / cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	NORM	REC	Cargue la cinta de prueba STD-630 y establezca el modo de grabación.	Conjunto mecánico 2 T2251	Area entre Ⓐ y Ⓑ (conjunto mecánico 2) mostrada en la Fig. 1-6.	La frecuencia de oscilación es de 105 kHz ±5 kHz.	

4. Ajuste del nivel de grabación

Procedimiento	Selector de cinta	Modo	Señal de entrada / cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	NORM	REC	Aplique una señal de 315 Hz al terminal de entrada LD/VCR y ajuste la función a "LD/VCR".	Nivel de la señal de entrada	JP-L (canal izquierdo) JP-R (canal derecho)	−5.2 dBv *1	
2	NORM	REC / PLAY	Grabe y reproduzca la cinta de prueba STD-630 (315 Hz).	Conjunto AF VR2201 (canal izquierdo) VR2202 (canal derecho)	JP-L (canal izquierdo) JP-R (canal derecho)	Repita la grabación/reproducción, y realice ajustes de forma que el nivel de reproducción de 315 Hz sea de −5,2 dBv.	

5. Ajuste de las características de frecuencia de grabación/reproducción

- Como este procedimiento es para el ajuste de la polarización de grabación, tenga cuidado de no aumentar el valor de distorsión mediante el subajuste de la polarización.

Procedimiento	Selector de cinta	Modo	Señal de entrada / cinta de prueba	Punto de ajuste	Punto de medición	Valor de ajuste	Observaciones
1	NORM	REC	Aplique una señal de 315 Hz al terminal de entrada LD/VCR y ajuste la función a "LD/VCR".	Nivel de la señal de entrada	JP-L (canal izquierdo) JP-R (canal derecho)	−25.2 dBv *2	
2	NORM	REC / PLAY	Grabe y reproduzca la cinta de prueba STD-630 (315 Hz y 10 kHz).	Conjunto mecánico 2 VR2251 (canal izquierdo) VR2252 (canal derecho)	JP-L (canal izquierdo) JP-R (canal derecho)	Repita la grabación/reproducción, y realice ajustes de forma que el nivel de reproducción de 10 kHz sea de 0 ±0,5 dB en relación con 315 Hz.	

• Punto de ajuste

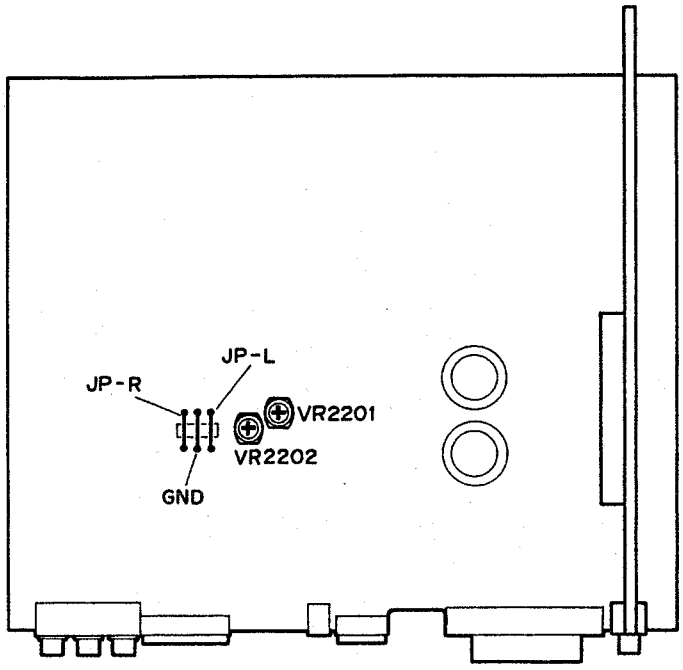
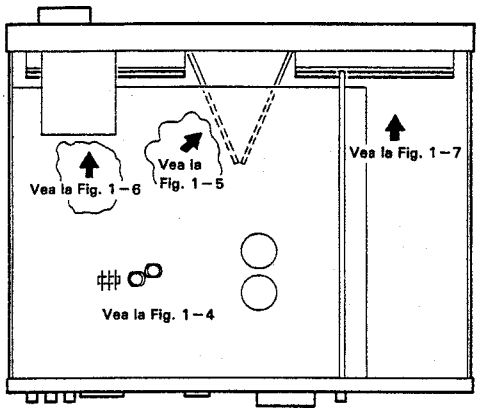
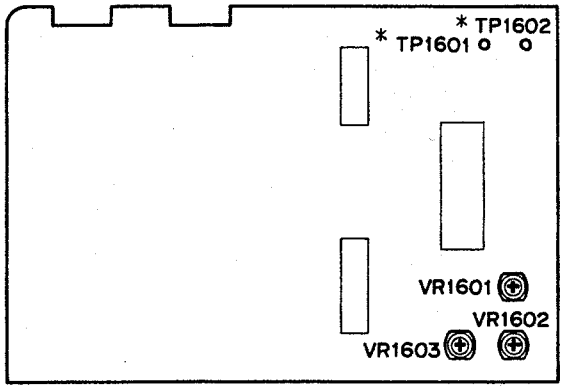


Fig. 1 – 4 Conjunto AF





* : TP1601 y TP1602 no están indicados sobre el tablero.

Fig. 1 – 5 Conjunto DISPLAY

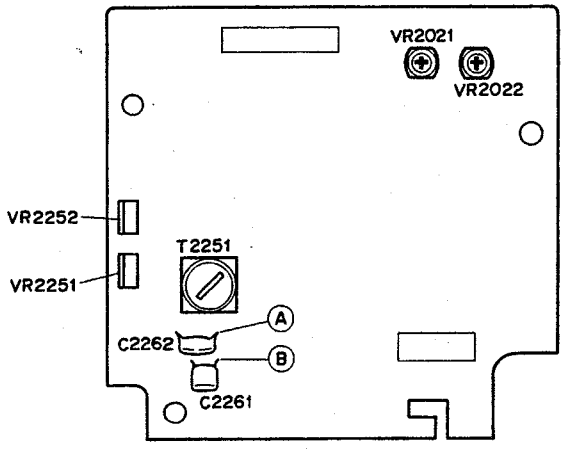


Fig. 1 – 6 Conjunto mecánico 2

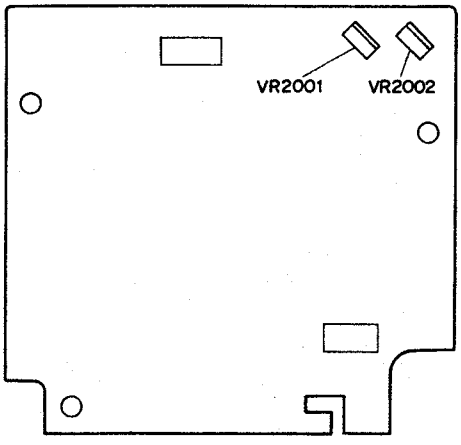


Fig. 1 – 7 Conjunto mecánico 1

2. CD BLOCK

● FOR XD-Z54T AND XD-Z84T TYPES ONLY

1. Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

1-1 Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Grating adjustment	TP1, Pin 2 (TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Pickup radial/ tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1 (RF)	VR1 (RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5 (FCS. IN) TP1, Pin 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3 (TRK. IN) TP1, Pin 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Focus error signal verification	TP1, Pin 6 (FCS. ERR)	———

● **Abbreviation table**

FCS. ERR : Focus Error
FCS. OFS : Focus Offset
TRK. ERR : Tracking Error
TRK. BAL : Tracking Balance
FCS. IN : Focus In
TRK. IN : Tracking In

1-2 Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 12-cm disc (with at least about 70 minutes of recording)
5. Low-pass filter (39 kΩ + 0.001 μF)
6. Resistor (100 kΩ)
7. Hexagonal wrench (M3 mm)
8. Standard tools

1-3 Test point and adjustment variable resistor positions

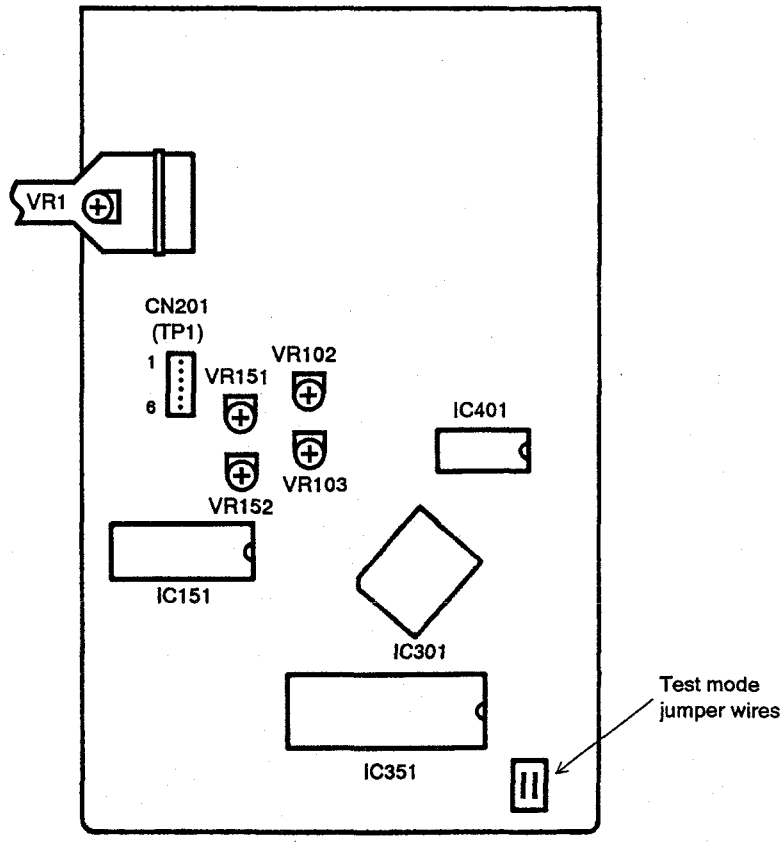


Figure 1 Adjustment Locations

1-4 Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

1-5 Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.
1. Turn off the power switch.
2. Short the test mode jumper wires. (See Figure 1.)
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1-3.

[Release from test mode]

Here is the procedure for releasing the test mode:
1. Press the STOP key and stop all operations.
2. Turn off the power switch on the front panel.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	PGM (PROGRAM)	Focus servo close	If Disc Tray 1 is closed, Disk Tray 1 is moved to the play position. Then the laser diode is lit up and the focus actuator is lowered, then raised slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down, then the actuator is raised and lowered twice and returned to its original position.
►	PLAY	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
▮▮	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.
⏮/ ◄◄	TRACK/ MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
►►/ ⏭	TRACK/ MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
■	STOP	Stop	Switches off all the servos and initializes. The pickup remains where it was when this key was pressed.
▲	OPEN/CLOSE DISC 1	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key and open/close tray alternately.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

PGM	Lights up the laser diode and closes the focus servo.
⇓	
PLAY ▶	Starts the spindle motor and closes the spindle servo.
⇓	
PAUSE ▮▮	Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus offset adjustment

● Objective ● Symptom when out of adjustment	Sets the DC offset for the focus error amp. The player does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR103 (FCS OFS) None needed

[Procedure]

Adjust VR103 (FCS OFS) so that the DC voltage at TP1, Pin 6 (FCS ERR) is –50 ± 50 mV.

2. Grating adjustment

● Objective ● Symptom when out of adjustment	To align the tracking error generation laser beam spots to the optimum angle on the track Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open Pickup grating adjustment slit 12 cm disc. (YEDS-7 can not be used.)

[Procedure]

1. Move the pickup to the outer edge of the disc with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key so that the grating adjustment slit is at the outer edge of the disc where it can be adjusted.
2. Press the PGM key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver counterclockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver counterclockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

   Reference: Figure 3 shows the relation between the angle of the tracking beam with the track and the wave form.

   Note: The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 µF low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens may be dirty or the pickup malfunctioning. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.
5. Return the pickup to more or less midway across the disc with the TRACK/MANUAL SEARCH REV |◀◀ / ◀◀ key, press the PAUSE ▮▮ key and check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, check the null point and adjust the grating again.

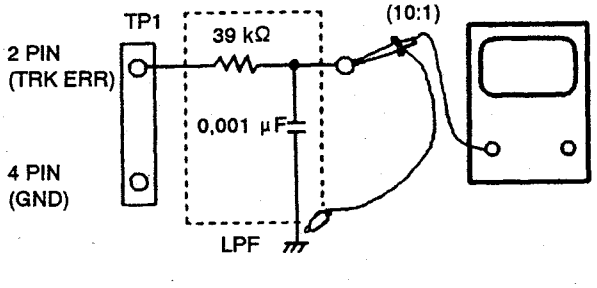
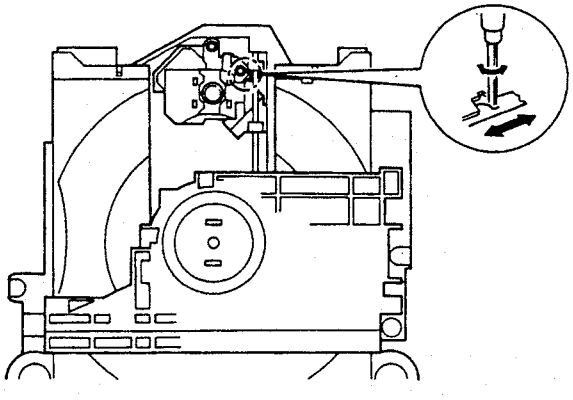


Figure 2



Adjustment Locations

[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)
This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

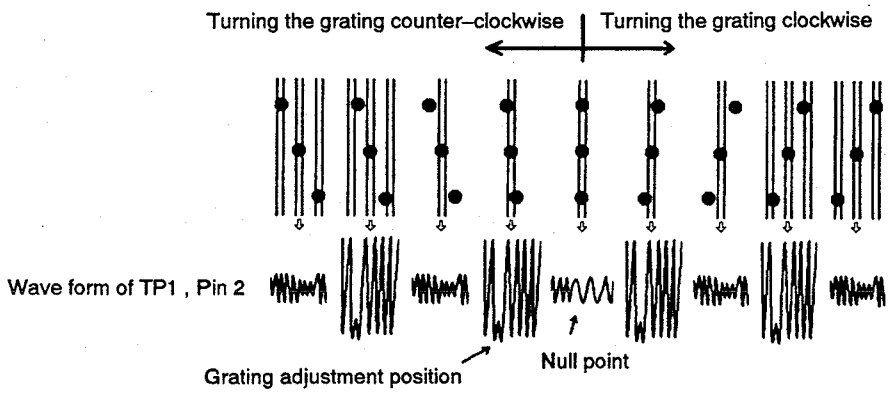
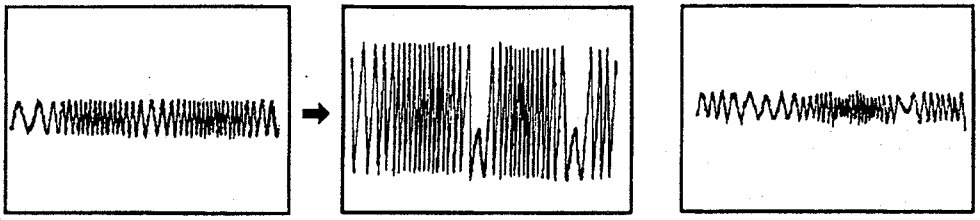


Figure 3



Nullo point waveform

Maximum amplitude waveform

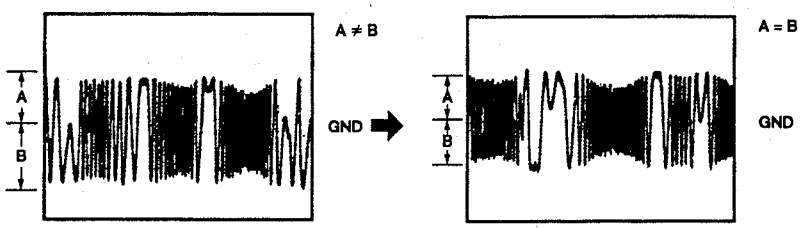
Waveform other than the null point

3. Tracking error balance adjustment

● Objective	To correct for the variation in the sensitivity of the tracking photodiode		
● Symptom when out of adjustment	Play does not start or track search is impossible		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open VR102 (TRK BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key.
2. Press the PGM key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK BAL) so that positive amplitude and negative amplitude of the tracking error signal at TP1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup radial/tangential tilt adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play Pickup radial tilt adjustment screw and tangential tilt adjustment screw 12 cm disc. (YEDS-7 can not be used.)

[Procedure]

1. Move the pickup to the outer edge of the disc with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key so that the radial/tangential tilt screws can be adjusted.
   Press the PGM key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the focus servo then the spindle servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with an M3 mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with an M3 mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

   Note: Radial and tangential mean the directions relative to the disc shown in Figure 4.

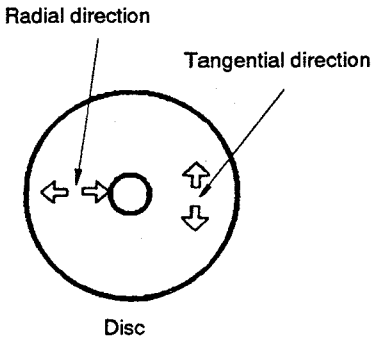
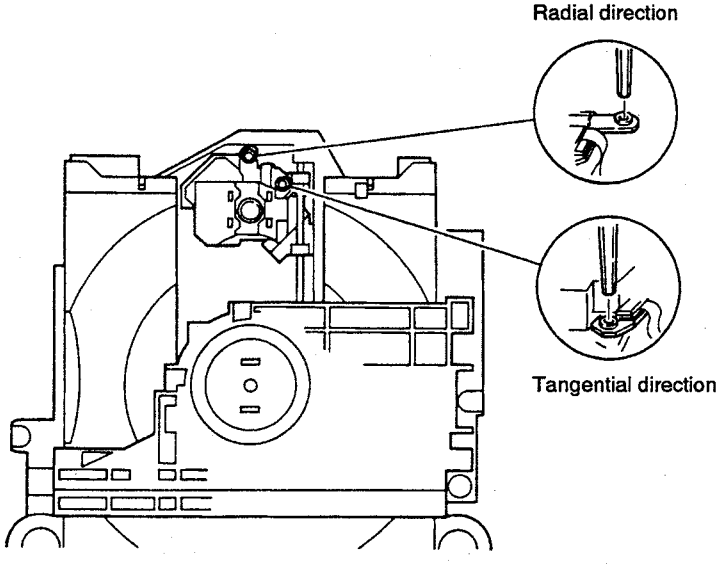


Figure 4



Adjustment Locations

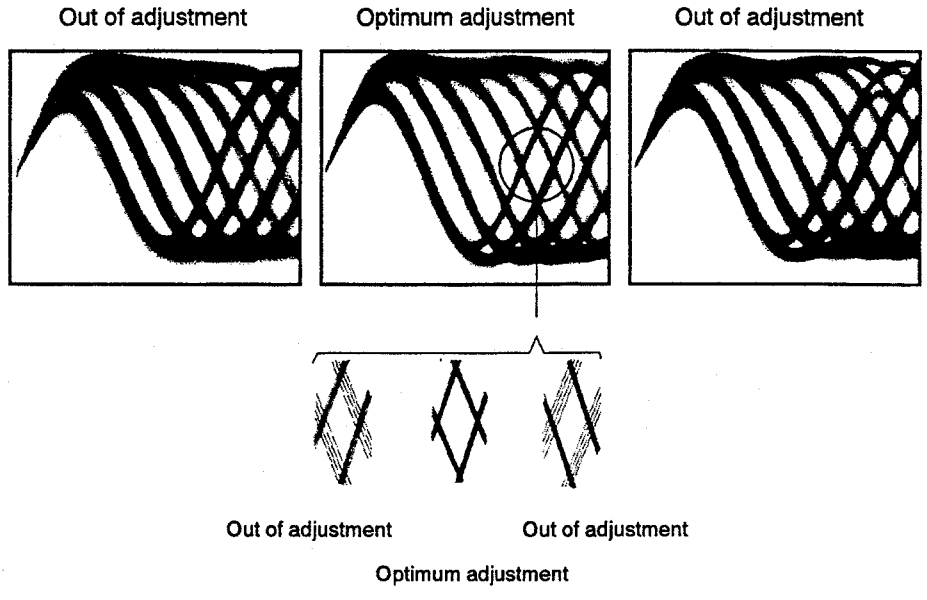


Figure 5 Eye Pattern

5. RF level adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play VR1 (laser power) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key, then press the PGM key, then the PLAY ▶ key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is 1.2 Vp-p ± 0.1V.

6. Focus servo loop gain adjustment

● Objective ● Symptom when out of adjustment	To optimize the focus servo loop gain Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Figure 6. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PGM key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

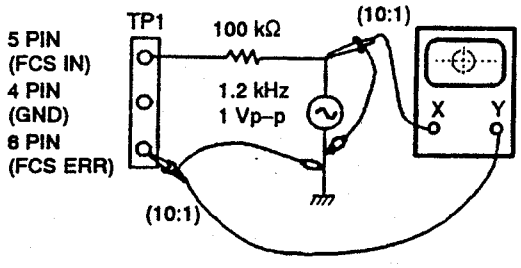
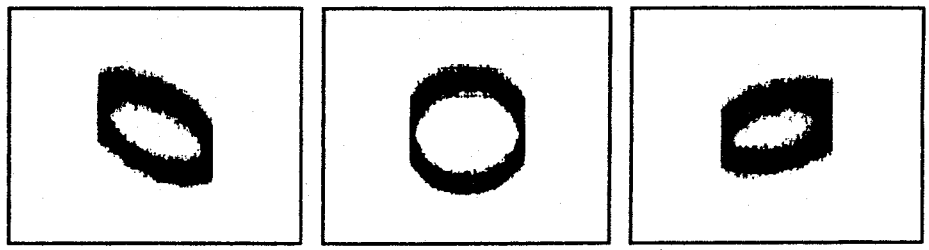


Figure 6

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

7. Tracking servo loop gain adjustment

● Objective	To optimize the tracking servo loop gain		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 7. [Settings] CH1 50 mV/division CH2 50 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR151 (TRK GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▶▶/▶▶| or |◀◀/◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PGM key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

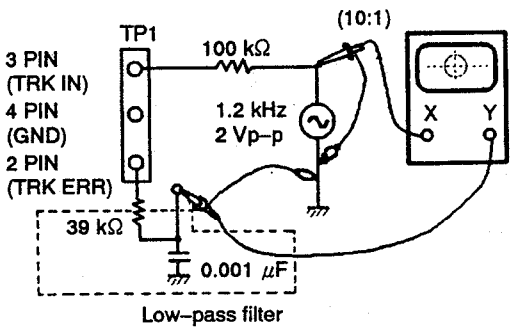
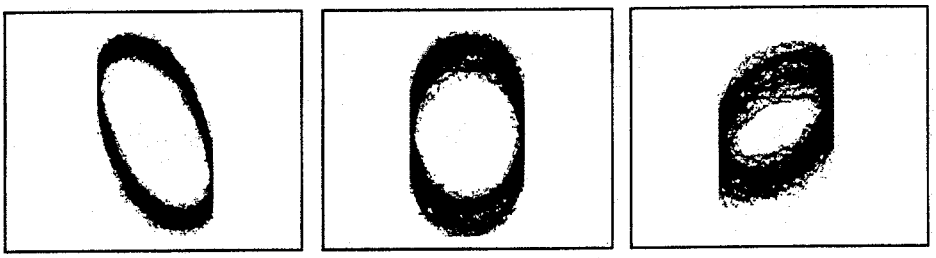


Figure 7

Tracking Gain Adjustment



Higher gain | Optimum gain | Lower gain

8. Focus error signal (focus S curve) verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PGM key and observe the wave form in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the wave form is only output for a moment when the PGM key is pressed, press this key over and over until you have checked the wave form.

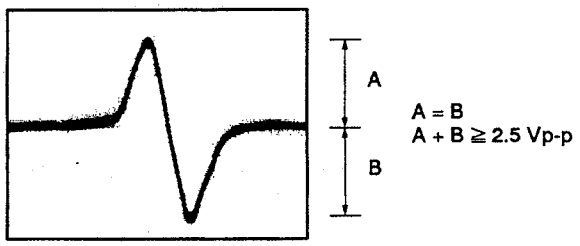


Figure 8

[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2:1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

2. BLOC CD

● POUR LES TYPES XD–Z54T ET XD–Z84T SEULEMENT

1. Méthodes de réglage

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

1–1 Points de réglage/Point et ordre de vérification

Etape	Point	Point d'essai	Emplacement du réglage
1	Réglage du décalage de la mise au point	TP1, Broche 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Réglage du réseau de diffraction	TP1, Broche 2 (TRK. ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP1, Broche 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Réglage d'inclinaison radiale/tangentielle du capteur	TP1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, Vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de boucle asservie de la mise au point	TP1, Broche 5 (FCS. IN) TP1, Broche 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP1, Broche 3 (TRK. IN) TP1, Broche 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Vérification du signal d'erreur de la mise au point	TP1, Broche 6 (FCS. ERR)	———

● **Tableau des abbréviations**

FCS. ERR : erreur de mise au point
FCS. OFS : décalage de mise au point
TRK. ERR : erreur d'alignement
TRK. BAL : équilibrage d'erreur d'alignement
FCS. IN : mise au point correcte
TRK. IN : alignement correct

1–2 Intruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10:1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Disque de 12 cm (avec au moins 70 minutes d'enregistrement)
5. Filtre passe-bas (39 kΩ + 0,001 μF)
6. Résistance (100 kΩ)
7. Clé hexagonale (M3 mm)
8. Outils conventionnels

1-3 Point d'essai et positions de réglage de la résistance variable

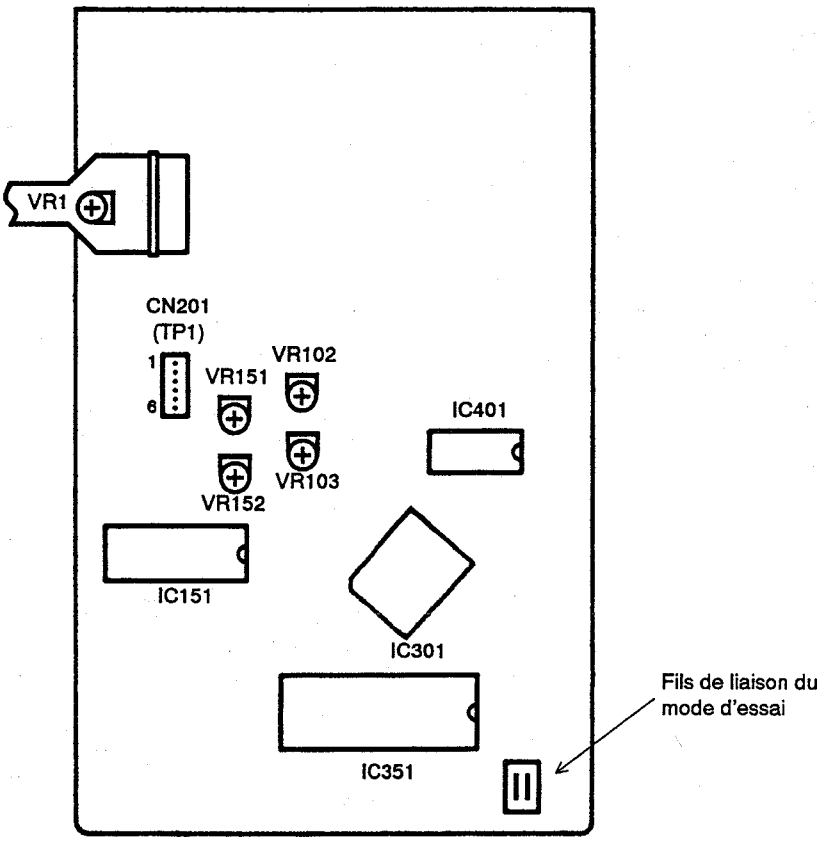


Figure 1 Emplacement des Réglages

1-4 Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10:1.

1-5 Mode d'essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.
1. Commuter l'interrupteur d'alimentation sur arrêt.
2. Court-circuiter les fils de liaison du mode d'essai. (voir Figure 1.)
3. Commuter l'interrupteur d'alimentation sur marche.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise sous tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

[Pour sortir du mode d'essai]

Voici la procédure pour sortir du mode d'essai.

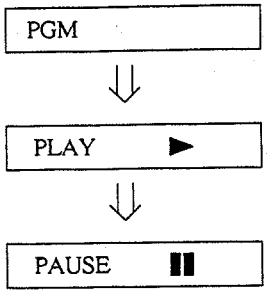
1. Appuyer sur la touche STOP pour arrêter toutes les opérations.
2. Sur le panneau avant, commuter l'interrupteur d'alimentation sur arrêt.

[Fonctionnement des touches en mode d'essai]

Code	Nom de la touche	Fonction en mode d'essai	Explications
	PGM (PROGRAMME)	Fermeture du circuit asservi de la mise au point	Si le plateau n ° 1 est fermé, il se place en mode de lecture. Ensuite la diode laser s'allume et l'actuateur de la mise au point s'abaisse, puis se relève lentement et le circuit servo de la mise au point se ferme au point où la lentille de l'objectif se focalise sur le disque. Quand l'appareil est dans cet état, si l'on fait légèrement tourner à la main le disque arrêté, le bruit produit par le circuit servo de la mise au point sera audible. Si ce bruit est perçu, le circuit servo de la mise au point fonctionne correctement. Si cette touche est enclenchée et qu'aucun disque n'est installé, la diode laser s'allume, l'actuateur de la mise au point s'abaisse, se relève, puis s'abaisse une deuxième fois et enfin, revient à sa position de départ.
▶	PLAY	Asservissement de rotation en service	Démarre le moteur de rotation dans le sens des aiguilles d'une montre, quand la rotation du disque atteint la vitesse prescrite (environ 500 tours/min à la circonférence interne) et place le circuit servo de rotation dans une boucle fermée. Attention. Si cette touche est enfoncée et qu'un disque n'est pas installé, le moteur de rotation va tourner á la vitesse maximum. Si le circuit servo de la mise au point ne passe pas comme prévu dans une boucle fermée ou que la diode laser brille dans le miroir à la périphérie externe du disque, le même symptôme se produit.
▮▮	PAUSE	Ouverture/Fermeture du circuit servo de l'alignement	Le fait d'appuyer sur cette touche quand le circuit servo de la mise au point et de la rotation fonctionnent correctement en boucles fermées, place le circuit servo de l'alignement dans une boucle fermée, fait apparaître, sur le panneau avant, le numéro de la piste en cours de lecture et la durée écoulée, puis sort le signal de lecture. Si la durée écoulée n'est pas affichée ou n'est pas correctement calculée, ou si la reproduction sonore est anormale, il se peut que la diode laser s'active dans la section dépourvue de signaux enregistrés, au bord externe du disque, qu'un ajustement quelconque soit déréglé, ou qu'un autre problème se manifeste. Cette touche est de type à bascule et ouvre/ferme alternativement le circuit servo de l'alignement. Cette touche est inopérante si un disque n'est pas installé.
⏮/ ◀◀	TRACK/ MANUAL SEARCH REV	Inversion du chariot (vers l'intérieur)	Déplace le capteur vers la périphérie interne du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
▶▶/ ⏭	TRACK/ MANUAL SEARCH FWD	Inversion du chariot (vers l'extérieur)	Déplace le capteur vers la périphérie externe du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
■	STOP	Arrêt	Met tous les circuits servo hors service et les initialise. Le capteur reste là où il était quand cette touche a été enclenchée.
▲	OPEN/CLOSE DISC 1	Ouverture/Fermeture	Ouvre/Ferme le plateau à disque. Cette touche est de type à bascule et ouvre/ferme alternativement le plateau.

[Lecture de disque en mode d'essai]

En mode d'essai, comme les circuits servo fonctionnent de manière indépendante, la lecture d'un disque exige que les touches soient enclenchées dans l'ordre prescrit, afin de fermer les circuits servo.
Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.



Allume la diode laser et ferme le circuit servo de la mise au point.

Démarre le moteur de rotation et ferme le circuit servo de la rotation.

Ferme le circuit servo de l'alignement.

Attendre 2 à 3 secondes entre chaque opération.

1. Réglage du décalage de la mise au point

● Objectif	Règle le décalage CC de l'amplificateur d'erreur de mise au point.		
● Symptôme quand déréglé	Le lecteur ne procède plus à la mise au point et le signal RF n'est pas clair.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR). [Réglages] 5 mV/division 10 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, arrêté (juste l'interrupteur d'alimentation commuté sur marche) VR103 (FCS OFS) Aucun requis

[Marche à suivre]

Ajuster VR103 (FCS OFS) de façon que la tension à TP1 broche 6 (FCS ERR) soit –50 ± 50 mV.

2. Réglage du réseau de diffraction

● Objectif	Pour aligner les points du rayon laser producteur d'erreur d'alignement sur l'angle optimum de la piste		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible, les pistes sont sautées.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR) via un filtre passe-bas. (Voir Figure 2) [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
		● Emplacement du réglage	Fente de réglage du réseau de diffraction du capteur
		● Disque	Disque de 12 cm. (Il est impossible d'employer le disque YEDS-7).

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀, de façon que la fente de réglage du réseau de diffraction se situe sur bord extérieur du disque, où elle peut être réglée.
2. Appuyer sur la touche PGM, puis sur la touche PLAY ▶, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Insérer un tournevis ordinaire dans le réseau de diffraction pour trouver le point zéro. Pour plus de détails, voir page suivante.
4. Si l'on tourne lentement le tournevis dans le sens contraire des aiguilles d'une montre à partir du point zéro, l'amplitude de l'onde augmente graduellement et si l'on continue à tourner le tournevis, l'amplitude de l'onde diminue de nouveau. Tourner le tournevis dans le sens contraire des aiguilles d'une montre à partir du point zéro et régler le réseau de diffraction au premier point où l'amplitude de l'onde atteint son maximum.

   Référence: La Figure 3 illustre la relation entre l'angle du faisceau de l'alignement et la piste et la forme d'onde.

   Remarque: L'amplitude du signal d'erreur d'alignement se situe aux environs de 3 Vc-c (quand un filtre passe-bas de 39 kΩ + 0,001 µF est utilisé). Si cette amplitude est extrêmement petite (2 Vc-c ou moins), la lentille de l'objectif risque alors de s'encrasser ou le capteur risque de mal fonctionner. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.
5. Replacer le capteur plus ou moins à mi-chemin sur le disque par la touche TRACK/ MANUAL SEARCH REV |◀◀ / ◀◀, appuyer sur la touche PAUSE ▮▮ et vérifier que le numéro de piste et la durée écoulée sont affichés sur le panneau avant. Si ces paramètres n'apparaissent pas ce moment, ou que la durée écoulée change de manière irrégulière, vérifier le point zéro et recommencer le réglage du réseau de diffraction.

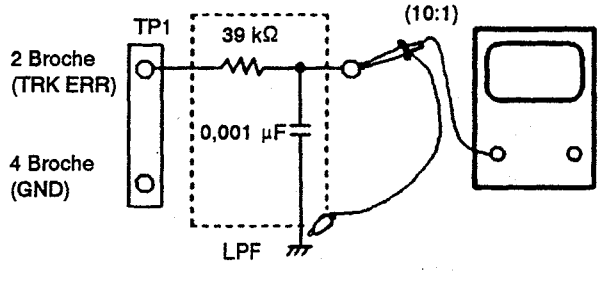
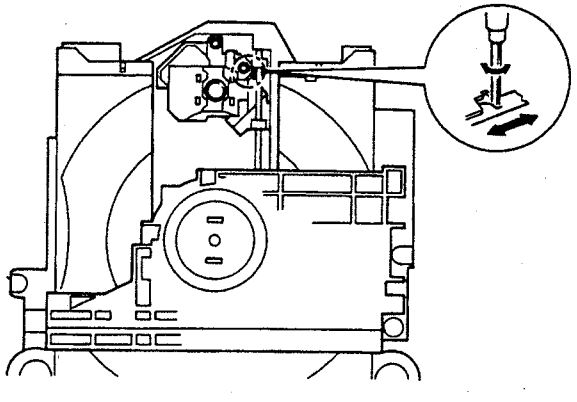


Figure 2



Emplacement des Réglages

[Repérage du point zéro]

Quand le tournevis est introduit dans la fente de réglage du réseau de diffraction et que l'angle du réseau de diffraction est modifié, l'amplitude du signal d'erreur d'alignement à TP1, broche 2, change. Dans les limites de la plage du réseau de diffraction, il existe six emplacements où l'amplitude de l'onde atteint le minimum. Mais l'enveloppe de la forme d'onde n'est régulière qu'à un seul de ces emplacements. Ce point se situe à l'endroit où les trois rayons laser, divisés par le réseau de diffraction, se situent exactement sur la même piste (voir Figure 3).
Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référence.

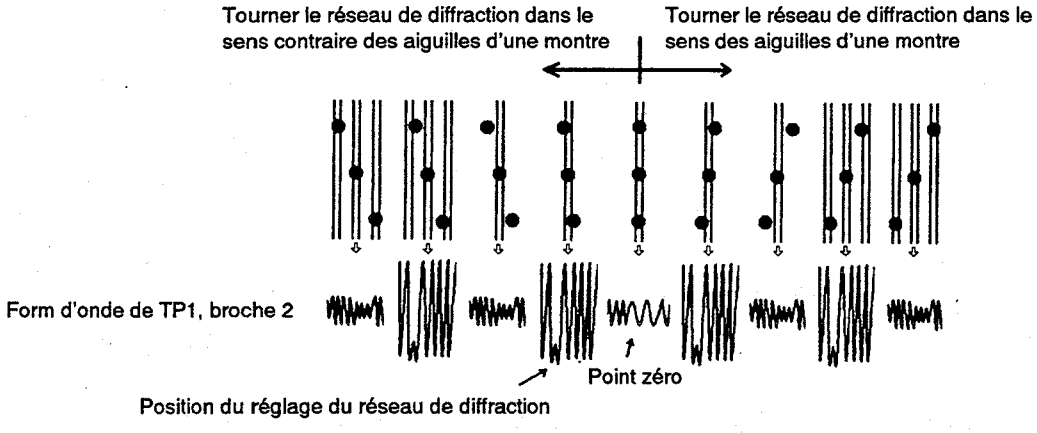
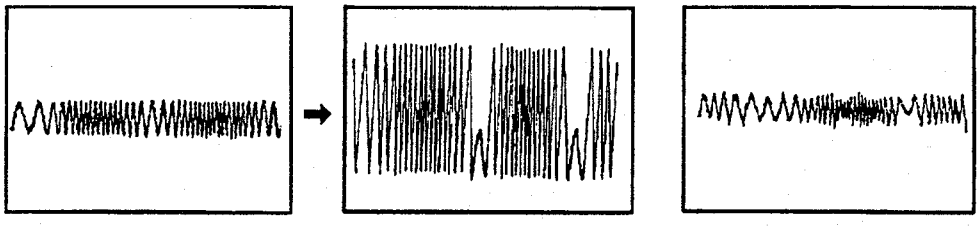


Figure 3



Forme d'onde du point zéro

Forme d'onde d'amplitude maximum

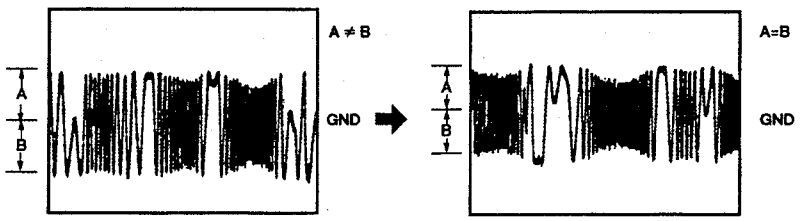
Forme d'onde autre que du point zéro

3. Réglage d'équilibrage d'erreur d'alignement

● Objectif	Pour corriger la variation de sensibilité de la photodiode d'alignement		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR).	● Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
	[Réglages] 50 mV/division 5 ms/division mode CC	● Emplacement du réglage	VR102 (TRK BAL)
		● Disque	YEDS-7

[Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque (R = 35 mm) par la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou |◀◀ / ◀◀.
2. Appuyer sur la touche PGM, puis sur la touche PLAY ▶, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Aligner la ligne lumineuse (masse) au centre de l'écran de l'oscilloscope et placer celui-ci en mode CC.
4. Ajuster VR102 (TRK BAL) de façon que l'amplitude positive et l'amplitude négative du signal d'erreur d'alignement à TP1, broche 2 (TRK ERR) soient identiques (c'est-à-dire, qu'il n'y ait aucun composant CC).



S'il y a un composant CC　　S'il n'y a pas de composant CC

4. Réglage d'inclinaison radiale/tangentielle du capteur

● Objectif	Pour régler l'angle du capteur par rapport au disque, de façon que les rayons laser frappent verticalement le disque et permettre ainsi la lecture optimum des signaux RF.		
● Symptôme quand déréglé	Son interrompu; certains disques peuvent être lus et pas d'autres.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 20 mV/division 200 ns/division mode CA	● Etat du lecteur	Mode d'essai, lecture
		● Emplacement du réglage	Vis de réglage d'inclinaison radiale Vis de réglage d'inclinaison tangentielle
		● Disque	Disque de 12 cm. (Il est impossible d'employer le disque YEDS-7).

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou |◀◀ / ◀◀, de façon que les vis de réglage d'inclinaison radiale et tangentielle puissent être réglées.

   Appuyer sur la touche PGM, PLAY ▶ et PAUSE ▮▮ dans cet ordre, afin de fermer le circuit servo de la mise au point, puis celui de la rotation et placer le lecteur en mode de lecture.

2. D'abord, ajuster la vis d'inclinaison radiale à l'aide d'une clé hexagonale M de 3 mm, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible.

3. Ensuite, ajuster la vis d'inclinaison tangentielle à l'aide d'une clé hexagonale M de 3 mm, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Figure 5).

4. Ajuster de nouvear la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.

   Remarque: "Radial" et "tangentiel" se rapportent aux sens par rapport au disque illustré à la Figure 4.

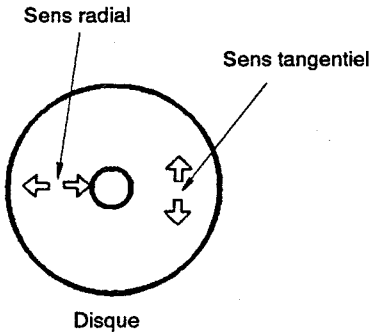
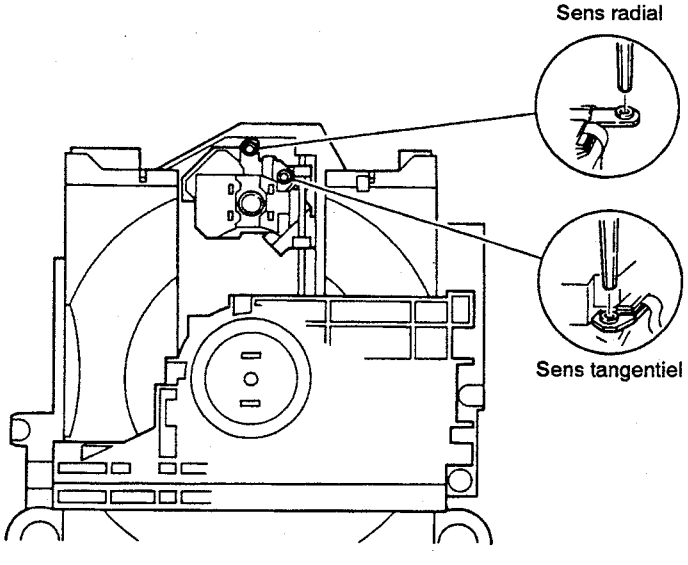


Figure 4



Emplacements des Réglages

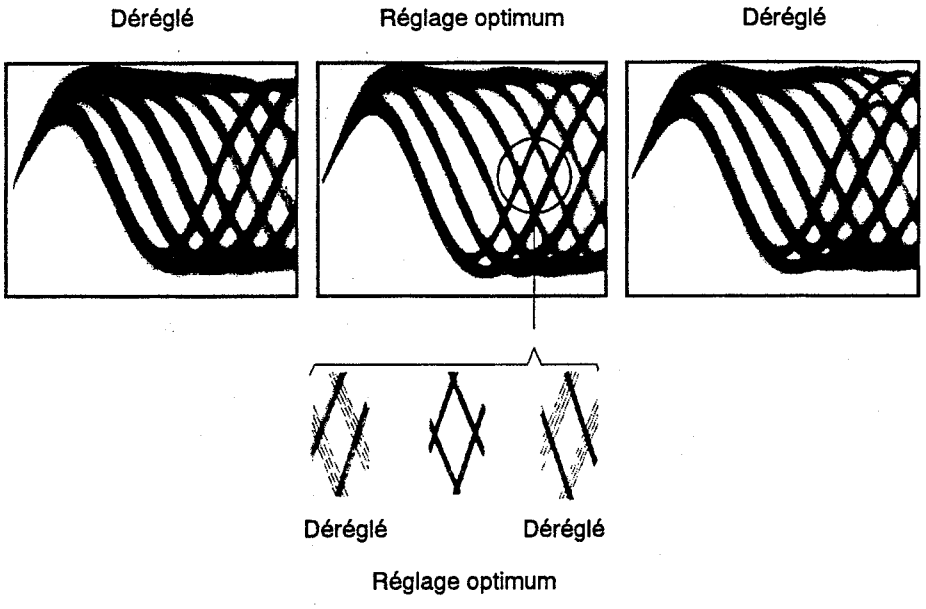


Figure 5 Motif en oeil

5. Réglage du niveau RF (niveau RF)

<table>
<tr><td>● Objectif

● Symptôme quand déréglé</td><td colspan="3">Pour optimaliser l'amplitude du signal RF de lecture

Pas de lecture ni de recherche</td></tr>
<tr><td>● Raccordement des instruments de mesure</td><td>Raccorder l'oscilloscope à TP1, broche 1 (RF)

[Rélages] 50 mV/division
10 ms/division
mode CA</td><td>● Etat du lecteur

● Emplacement du réglage

● Disque</td><td>Mode d'essai, lecture

VR1 (alimentation du laser)

YEDS-7</td></tr>
<tr><td colspan="4">[Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque (R = 35 mm) à l'aide de la touche TRACK/ MANUAL SEARCH FWD ▶▶ /▶▶| ou |◀◀ /◀◀. Ensuite, appuyer sur la touche PGM puis sur la touche PLAY ▶, dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.

2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne 1,2 Vc-c ± 0,1V.</td></tr>
</table>

6. Réglage de gain de boucle asservie de la mise au point

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de la mise au point.		
● Symptôme quand déréglé	La lecture ne commence pas ou l'actuateur de la mise au point est parasité.		
● Raccordement des instruments de mesure	Voir Figure 6 [Réglages] CAN. 1 CAN. 2 20 mV/division 5 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR152 (FCS GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PGM, la touche PLAY ▶, puis sur la touche PAUSE ▮▮, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR152 (FSC GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

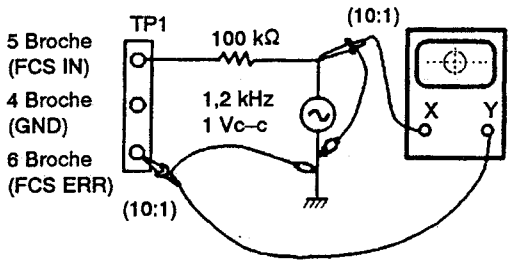
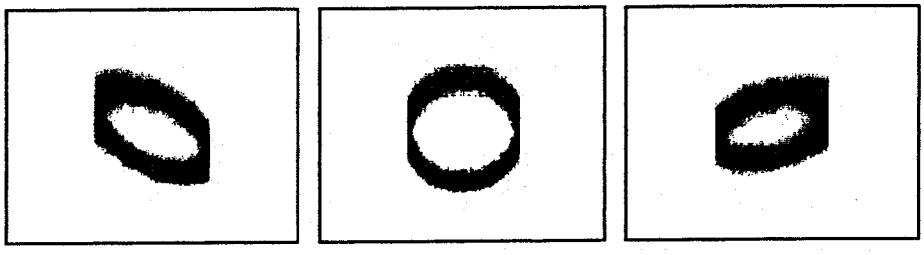


Figure 6

Adjustment de gain de mise au point



Gain supérieur | Gain optimum | Gain inférieur

7. Réglage de gain de boucle asservie de l'alignement

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de l'alignement.		
● Symptôme quand déréglé	La lecture ne commence pas, l'actuateur est parasité pendant la recherche, ou des pistes sont sautées.		
● Raccordement des instruments de mesure	Voir Figure 7 [Réglages] CAN. 1 CAN. 2 50 mV/division 50 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR151 (TRK GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PGM, la touche PLAY ▶, puis sur la touche PAUSE ▮▮, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR151 (TRK GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

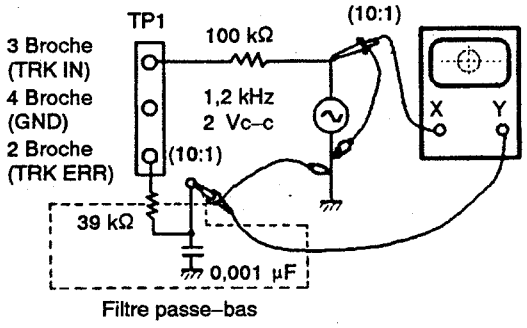
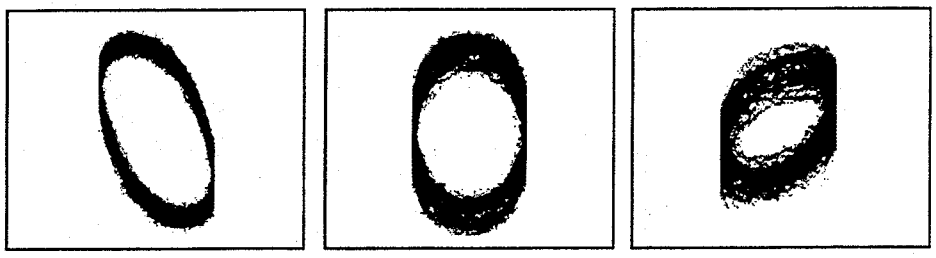


Figure 7

Adjustment de gain d'alignement



Gain supérieur | Gain optimum | Gain inférieur

8. Vérification du signal d'erreur de la mise au point

<table>
<tr><td>● Objectif

● Symptôme quand déréglé</td><td colspan="3">Pour juger si le capteur est bon ou pas, en observant le signal d'erreur de la mise au point. L'état du capteur s'évalue à partir de l'amplitude du signal d'erreur d'alignement (comme décrit dans le paragraphe relatif à l'équilibrage d'erreur d'alignement), ainsi qu'à partir de la forme d'onde du signal d'erreur de mise au point.</td></tr>
<tr><td>● Raccordement des instruments de mesure</td><td>Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR).

[Réglages] 100 mV/division
5 ms/division
mode CC</td><td>● Etat du lecteur

● Emplacement du réglage

● Disque</td><td>Mode de test, arrêt

Aucun

YEDS-7</td></tr>
</table>

[Marche à suivre]

1. Raccorder TP1, broche 5 à la masse.
2. Installer le disque.
3. Tout en regardant l'écran de l'oscilloscope, appuyer sur la touche PGM et observer la forme d'onde de la Figure 8, pendant quelques instants.Vérifier que l'amplitude atteint au moins 2,5 Vc-c et que les amplitudes positive et négatives soient égales. Comme la forme ne sort que pour un moment, quand la touche PGM est enclenchée, appuyer sur à plusieurs reprises sur cette touche, jusqu'à ce que la forme d'onde ait été vérifiée.

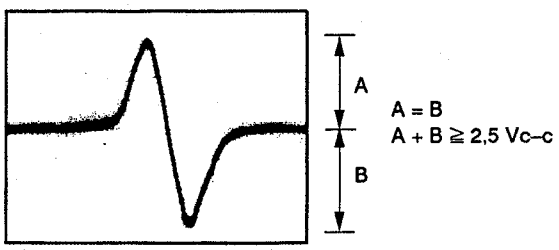


Figure 8

[Evaluation du capteur]

Ne pas tenter d'évaluer l'état du capteur tant que tous les réglages ne sont pas corrects. Les cas suivants témoignent de l'anomalie du capteur.

1. L'amplitude du signal d'erreur d'alignement est extrêmement petite (inférieure à 2 Vc-c).
2. L'amplitude du signal d'erreur de mise au point est extrêmement petite (inférieure à 2,5 Vc-c).
3. Les amplitudes positive et négative du signal d'erreur de mise au point sont extrêmement asymétriques (taux 2:1 ou plus).
4. Le signal RF est trop petit (inférieur à 0,8 Vc-c) et même si VR1 (alimentation du laser) est ajustée, le signal RF ne peut être élevé au niveau standard.

2. BLOQUE CD

● SOLO PARA LOS TIPOS XD-Z54T Y XD-Z84T

1. Métodos de ajuste

Si un reproductor de discos compactos se ajusta incorrecta o inadecuadamente, puede funcionar mal o no trabajar incluso aunque no exista ningún problema en el captor ni en los circuitos. Ajuste correctamente siguiendo el procedimiento de ajuste.

1-1 Ítemes de ajuste/verificación y orden

Paso	Ítem	Punto de prueba	Lugar de ajuste
1	Ajuste del descentramiento de enfoque	TP1, Patilla 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Ajuste de retícula	TP1, Patilla 2 (TRK. ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de ajuste de seguimiento	TP1, Patilla 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Ajuste de la inclinación en sentido *radial/tangencial del captor*	TP1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial *Tornillo de ajuste de la inclinación tangencial*
5	Ajuste del nivel de RF	TP1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP1, Patilla 5 (FCS. IN) TP1, Patilla 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Ajuste de la ganancia del bucle del servo de seguimiento	TP1, Patilla 3 (TRK. IN)) TP1, Patilla 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Verificación de la señal de error de enfoque	TP1, Patilla 6 (FCS. ERR)	———

● **Tabla de abreviaturas**

FCS. ERR : Error de enfoque
FCS. OFS : Descentramiento de enfoque
TRK. ERR : Error de seguimiento
TRK. BAL : Equilibrio de seguimiento
FCS. IN : Entrada de enfoque
TRK. IN : Entrada de seguimiento

1-2 Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (Sonda de 10:1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Disco de 12 cm (con 70 minutos de grabación por lo menos)
   Para el tipo de reproducción múltiple de disco compacto, emplee solamente el disco de prueba YEDS-7.
5. Filtro de paso bajo (39 kΩ + 0,001 μF)
6. Resistor (100 kΩ)
7. Llave hexagonal (M3 mm)
8. Herramientas estándar

1-3 Ubicación de los puntos de prueba y los resistores variables de ajuste

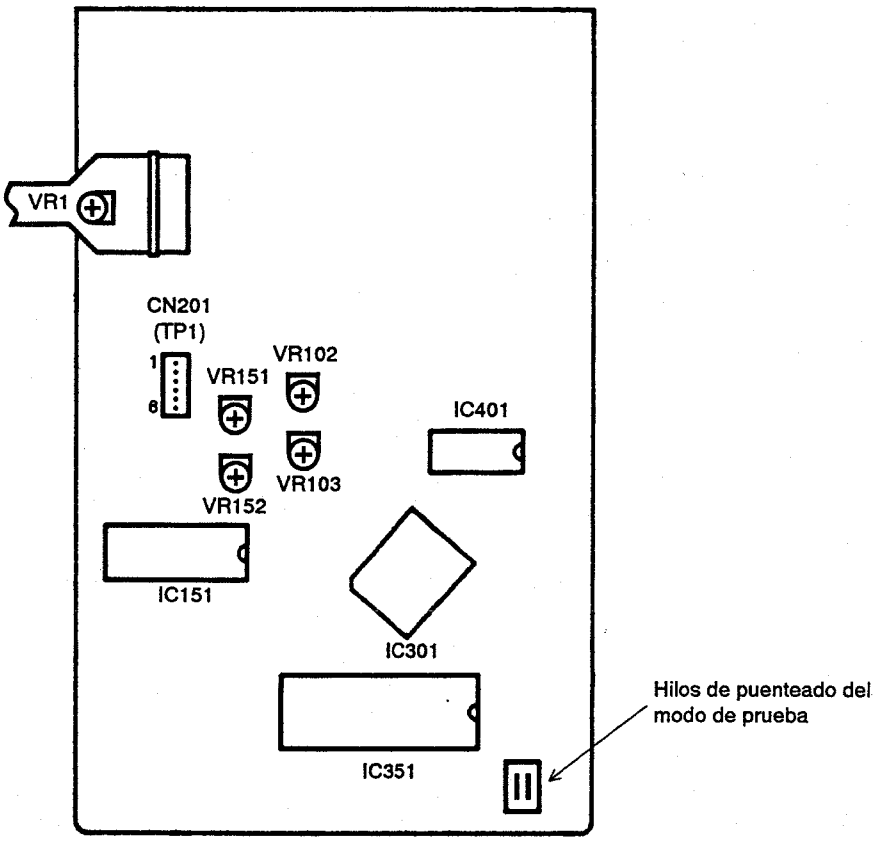


Figura 1 Lugares de Ajuste

1-4 Notas

1. Emplee una sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando se emplee la sonda de 10:1.

1-5 Modo de prueba

Estos modelos poseen un modo de prueba que permite realizar fácilmente los ajustes y las comprobaciones requeridos para el servicio. Cuando estos modelos estén en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y las comprobaciones podrán realizarse accionando estas teclas de acuerdo con el procedimiento correcto. Para estos modelos, todos los ajustes se realizarán en el modo de prueba.

[Puesta de estos modelos en el modo de prueba]

A continuación se indica cómo poner estos modelos en el modo de prueba.
1. Ponga en OFF el interruptor de alimentación.
2. Cortocircuite los hilos de puenteado de modo de prueba. (Consulte la figura 1.)
3. Ponga en ON el interruptor de alimentación.

Cuando haya ajustado correctamente el modo de prueba, la visualización será diferente a la obtenida normalmente al conectar la alimentación. Si la visualización sigue siendo la normal, el modo de prueba no se habrá ajustado normalmente, por lo que tendrá que repetir los pasos 1 a 3.

[Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.

1. Presione la tecla STOP y cese todas las operaciones.
2. Ponga en OFF el interruptor de alimentación del panel frontal.

[Operaciones de teclas en el modo de prueba]

Código	Nombre de la tecla	Función en el modo de prueba	Explicación
	PGM (PROGRAMA)	Cierre del servo de enfoque	Si la bandeja de disco 1 está cerrada, ésta se moverá hasta la posición de reproducción. Después el diodo láser se encenderá y el actuador de enfoque descenderá, después se elevará lentamente, y el servo de enfoque se cerrará en el punto en el que el objetivo se enfoque sobre el disco. Con el reproductor en este estado, si gira ligeramente con la mano el disco parado podrá oír el sonido del servo de enfoque. Si puede oír este sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se verá empujado hacia abajo, y después se levantará y descenderá dos veces, y volverá a su posición original.
►	PLAY	Activación del servo del eje	Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado. Tenga cuidado. Si presiona esta tecla cuando no haya disco montado, el motor del eje girará a la velocidad máxima. Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz lasérico incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.
▮▮	PAUSE	Apertura/cierre del servo de seguimiento	Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de sequimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que esté reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción. Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo lasérico esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema. Esta tecla es basculante (de acción alternativa) y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.
⏮/ ◄◄	TRACK/ MANUAL SEARCH REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
►►/ ⏭	TRACK/ MANUAL SEARCH FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
■	STOP	Parada	Desactivará todos los servos e inicializará la unidad. El captor permanecerá donde estaba cuando se presionó esta tecla.
▲	OPEN/CLOSE DISC1	Apertura/cierre de la bandeja del disco	Abrirá/cerrará la bandeja del disco. Esta tecla es basculante (de acción alternativa) y abre/cierra la bandeja alternativamente.

[Cómo reproducir un disco en el modo de prueba]

En el modo de prueba, como los servos funcionan independientemente, la reproducción de un disco requiere el que usted emplee las teclas en el orden correcto para cerrar los servos.
A continuación se indica la secuencia de operación de teclas para reproducir un disco en el modo de prueba.

PGM	Hará que se encienda el diodo láser y cerrará el servo de enfoque.
⇓	
PLAY ▶	Pondrá en marcha el motor del eje y hará que se cierre el servo del eje.
⇓	
PAUSE ▮▮	Cerrará el servo de seguimiento.

Espere de 2 a 3 segundos por lo menos entre cada una de estas operaciones.

1. Ajuste del descentramiento del enfoque

● Objetivo ● Síntomas en caso de desajuste	Ajuste de la tensión de CC para el amplificador de error de enfoque. El reproductor no enfoca y la señal de RF contiene perturbaciones.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 5 mV/división 10 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parado (con el interruptor de alimentación en ON) VR103 (FCS OFS) No es necesario

[Procedimiento]

Ajuste VR103 (FCS OFS) de forma que la tensión de CC de TP1, patilla 6, (FCS ERR) sea de –50 ± 50 mV.

2. Ajuste de retícula

● Objetivo	Alineación de los puntos del haz lasérico de generación de error de seguimiento al ángulo óptimo en la pista		
● Síntomas en caso de desajuste	La reproducción no se inicia, la búsqueda de canciones es imposible, las pistas se saltan.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR) a través de un filtro de paso bajo. (Consulte la figura 2) [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto Ranura de ajuste de retícula del captor Disco de 12 cm. (El disco YEDS-7 no podrá emplearse.)

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ de forma que la ranura de ajuste de la retícula quede en el borde exterior del disco, donde puede ajustarse.
2. Presione la tecla PGM, y después la tecla PLAY ▶, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo.
   Para más detalles, consulte la página siguiente.
4. Si gira lentamente el destornillador hacia la izquierda desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el destornillador hacia la izquierda desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

   Referencia: En la figura 3 se muestra la relación entre el ángulo del haz de seguimiento con la pista y la forma de onda.

   Nota: La amplitud de la señal de error de seguimiento será de aproximadamente 3 Vp-p (cuando se emplee un filtro de paso bajo de 39 kΩ , 0,001 µF). Si esta amplitud es extremadamente pequeña (2 Vp-p o menos), es posible que el objetivo esté sucio o que el captor esté funcionando mal. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver a ajustarla.
5. Devuelva el captor hasta la mitad más o menos del disco con la tecla TRACK/MANUAL SEARCH REV |◀◀ / ◀◀, presione la tecla PAUSE ▮▮, y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

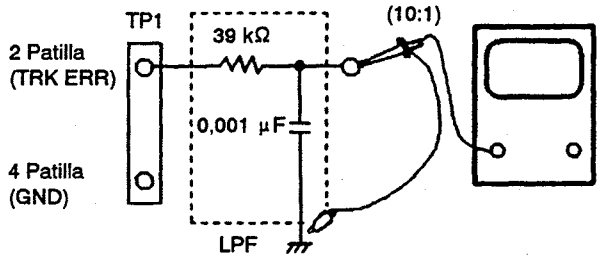
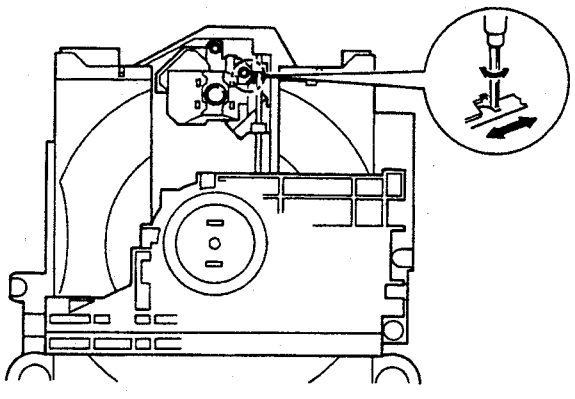


Figura 2



Lugares de Ajuste

[Cómo encontrar el punto nulo]

Cuando inserte el destornillador normal en la ranura para el ajuste de la retícula y cambie el ángulo de la misma. La amplitud de la señal de error de seguimiento de TP1, patilla 2, cambiará. Dentro del margen para la retícula existen cinco o seis lugares en los que la amplitud alcanza el valor mínimo. De estos cinco o seis lugares, solamente hay uno en el que la envolvente de la forma de onda es uniforme. Este lugar es donde los tres haces lasércicos divididos por la retícula se encuentran exactamente sobre la misma pista. (Consulte la figura 3.) Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.

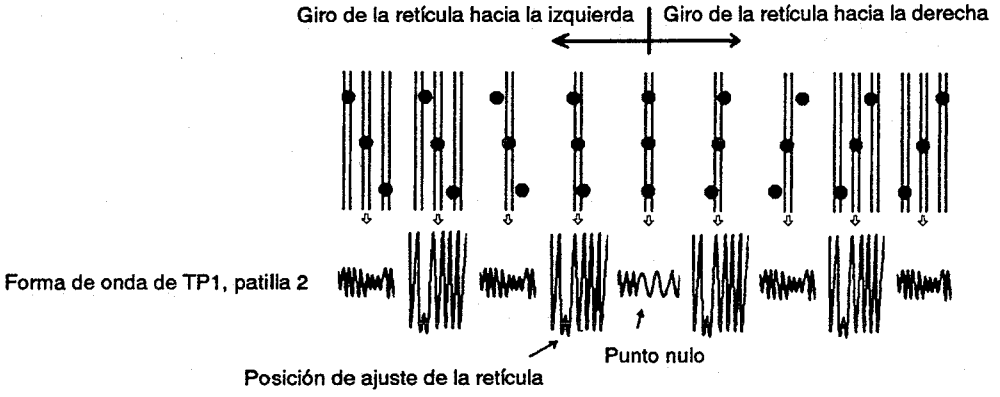
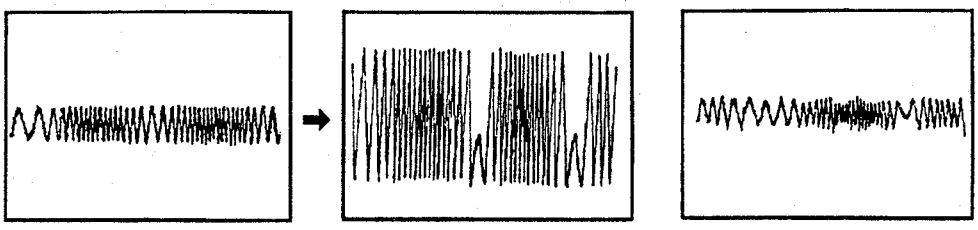


Figura 3



Forma de onda del punto nulo

Forma de onda de amplitud máxima

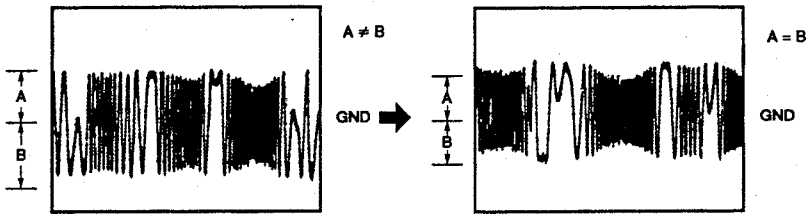
Forma de onda que no es el punto nulo

3. Ajuste del equilibrio de error de seguimiento

● Objetivo ● Síntomas en caso de desajuste	Corrección de la variación de la sensibilidad del fotodiodo de seguimiento La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR). Esta conexión puede realizarse a través de un filtro de paso bajo. [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto VR102 (TRK BAL) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK/MANUAL SEARCH FWD ▶▶/▶▶| o |◀◀/◀◀.
2. Presione la tecla PGM, y después la tecla PLAY ▶, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Haga coincidir la línea brillante (masa) del centro de la pantalla del osciloscopio y ponga éste en el modo de CC.
4. Ajuste VR102 (TRK BAL) de forma que la amplitud positiva y la negativa de la señal de error de seguimiento de TP1, patilla 2, (TRK ERR) sean iguales (en otras palabras, de forma que no haya componente de CC).



Cuando hay componente de CC

Cuando no hay componente de CC

4. Ajuste de la inclinación en sentido radial/tangencial del captor

● Objetivo	Ajustar el ángulo del captor en relación con el disco de forma que los haces laséricos incidan perpendicularmente sobre el mismo a fin de poder leer con la mayor exactitud las señales de RF.		
● Síntomas en caso de desajuste	Sonido quebrado, algunos discos pueden reproducirse pero otros no.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 20 mV/división 200 ns/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción Tornillo de ajuste de la inclinación radial y tornillo de ajuste de la inclinación tangencial Disco de 12 cm. (El disco YEDS-7 no podrá emplearse.)

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ de forma que puedan ajustarse los tornillos de inclinación radial/tangencial.
   Presione la tecla PGM, la tecla PLAY ▶, y después la tecla PAUSE ▮▮, por este orden, a fin de cerrar el servo de enfoque, después el servo del eje, y por último para poner el reproductor en el modo de reproducción.
2. En primer lugar, gire el tornillo de ajuste de inclinación radial con una llave hexagonal M 3 mm hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad.
3. A continuación, ajuste el tornillo de ajuste de inclinación tangencial con una llave hexagonal M 3 mm hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad (figura 5).
4. Vuelva a girar el tornillo de ajuste de inclinación radial y el tornillo de inclinación tangencial hasta que el patrón ocular pueda verse con la mayor claridad. Si es necesario, ajuste alternativamente los dos tornillos hasta que el patrón ocular pueda verse con la mayor claridad.

Nota: Radial y tangencial significan las direcciones en relación con el disco mostrado en la figura 4.

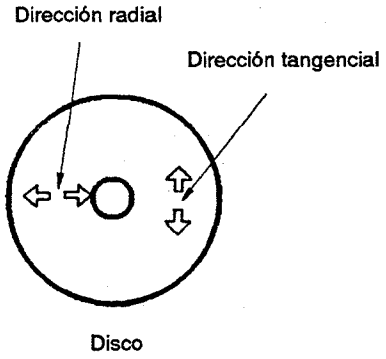
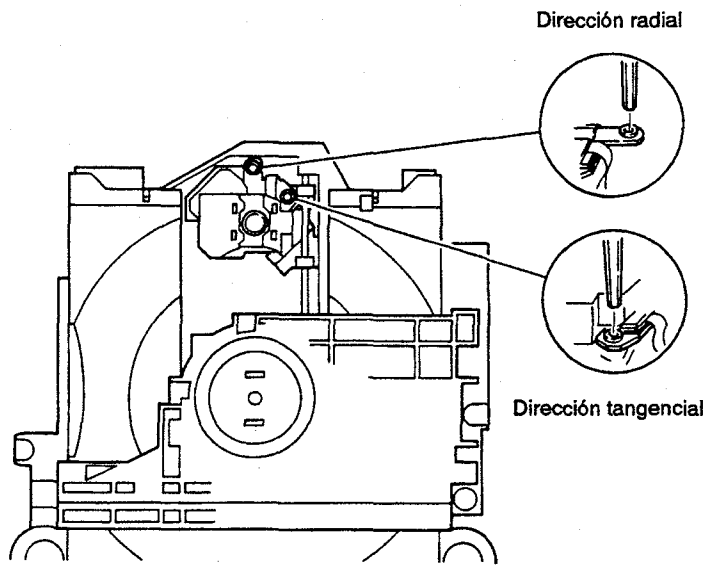


Figura 4



Lugares de Ajuste

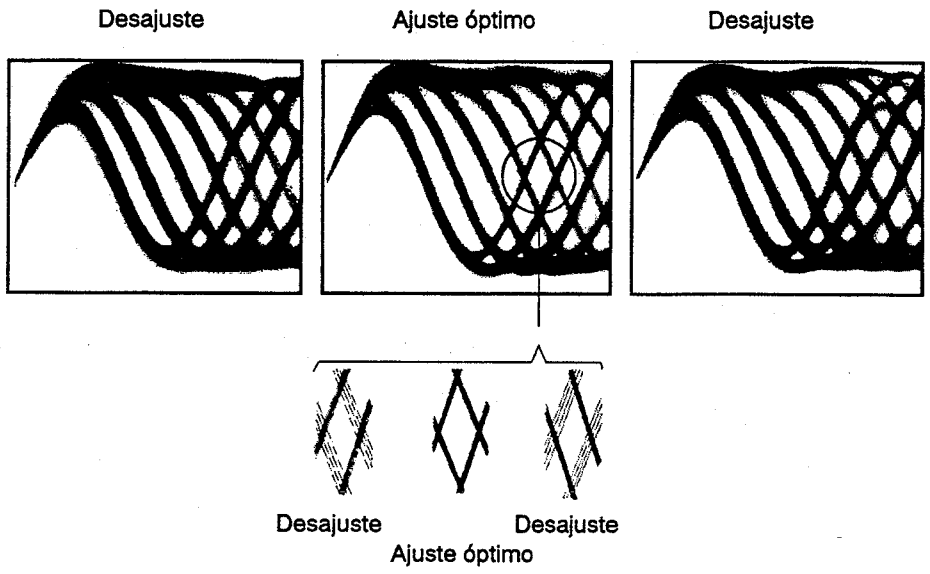


Figura 5 Patron Optico

5. Ajuste del nivel de RF

● Objetivo ● Síntomas en caso de desajuste	Optimización de la amplitud de la señal de RF de reproducción La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 50 mV/división 10 ms/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR1 (potencia de láser) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀, presione la tecla PGM, depués la tecla PLAY ▶, por este orden a fin de cerrar los servos respectivos, y ponga el reproductor en el mode de reproducción.
2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de 1,2 Vp-p ± 0,1 V.

6. Ajuste de la ganancia del bucle del servo de enfoque

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de enfoque La reproducción no se inicia o el actuador de enfoque produce ruido.		
● Conexión de los instrumentos de medición	Consulte la figura 6. [Ajustes] CH1 CH2 20 mV/división 5 mV/división Modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR152 (FCS GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK/MANUAL SEARCH FWD ▶▶/▶▶| o |◀◀/◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PGM, la tecla PLAY ▶, y después la tecla PAUSE ❚❚, por este orden, a fin de cerrar los servos correspondientes y poner el reproductor en el modo de reproducción.
3. Ajuste VR152 (FCS GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

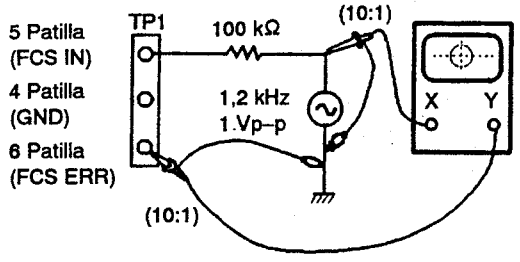
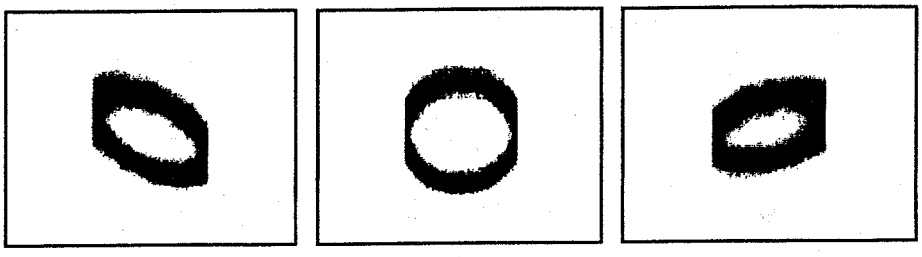


Figura 6

Ajuste de la ganancia de enfoque



Ganancia superior Ganancia óptima Ganancia inferior

7. Ajuste de la ganancia del bucle del servo de seguimiento

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de seguimiento La reproducción no se inicia, el actuador de enfoque produce ruido, o se saltan pistas.		
● Conexión de los instrumentos de medición	Consulte la figura 7. [Ajustes] CH1 CH2 50 mV/división 50 mV/división Modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR151 (TRK GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK/MANUAL SEARCH FWD ▶▶/▶▶| o |◀◀/◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PGM, la tecla PLAY ▶, y la tecla PAUSE ▮▮, por este orden, a fin de cerrar los servos respectivos y poner el reproductor en el modo de reproducción.
3. Ajuste VR151 (TRK GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

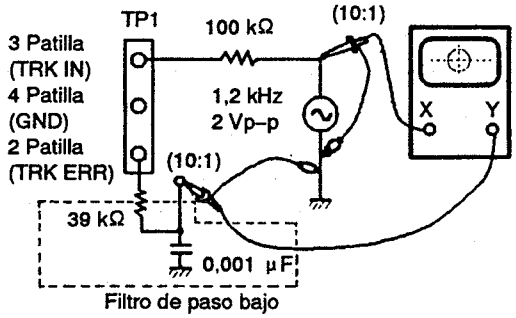
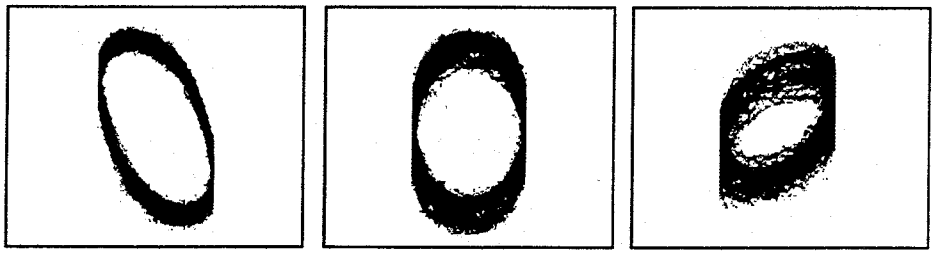


Figura 7

Ajuste de la ganancia de seguimiento



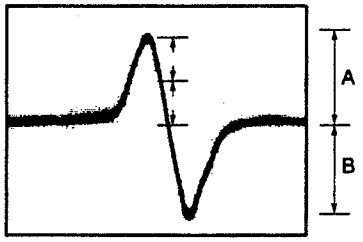
Ganancia superior | Ganancia óptima | Ganancia inferior

8. Verificación de la señal de error de enfoque (curva S de enfoque)

● Objetivo ● Síntomas en caso de desajuste	Juzgar si el captor est'a bien o no observando la señal de error de enfoque. El captor se juzga por la amplitud de la señal de error de seguimiento (como se ha indicado en la sección sobre el ajuste del equilibrio de error de seguimiento) y la forma de onda de la señal de error de enfoque.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 100 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parada Ninguno YEDS-7

[Procedimiento]

1. Conecte TP1, patilla 5, a masa.
2. Coloque el disco.
3. Contemplando la pantalla del osciloscopio, presione la tecla PGM y observe durante un momento la forma de onda de la figura 8. Verifique si la amplitud es de 2,5 Vp-p por lo menos y si la amplitud de las partes positiva y negativa son iguales. Como la forma de onda solamente sale durante un momento cuando se presiona la tecla PGM, presione una y otra vez esta tecla hasta que logre comprobar la forma de onda.



A = B
A + B ≧ 2,5 Vp–p

Figura 8

[Juicio sobre el captor]

No juzgue el captor hasta haber finalizado correctamente todos los ajustes. En los casos siguientes es posible que haya algo erróneo en el captor.

1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 Vp-p).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 Vp-p).
3. Las amplitudes de las partes positiva y negaiva de la señal de error de enfoque son extremadamente asimétricas (relación de 2:1 o superior).
4. La señal de RF es demasiado pequeña (menos de 0,8 Vp-p) y aunque se ajuste VR1 (potencia de láser), la señal de RF no puede aumentarse hasta el nivel estándar.